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WILKENS,P.C. Rochester Gas & Electric Corp.
RECIP.NAME RECIPIENT AFFILIATION
SHEA,J.J. TMI-2 Lessons Learned Task Force

SUBJECT: Forwards responses to 800325 Lessons Learned audit questions.

SEE RPT

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ROCHESTER GAS AND ELECTRIC CORPORATION • 39 EAST AVENUE, ROCHESTER, N.Y. 14649

TELEPHONE
AREA CODE 716 546-2700

April 3, 1980

Mr. J. J. Shea, Project Manager
DOR - Mail Stop 314
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Jim:

Enclosed are responses to the Three Mile Island Lessons Learned audit questions which you telecopied to us on March 25, 1980. If you have additional questions or require clarification please call.

Sincerely yours,

Paul C. Wilkens

Paul C. Wilkens

PCW:np
Enclosure

A042
~~A042~~
S
1/1

8004100461

RESPONSE TO R. E. GINNA
AUDIT RESPONSES

2.1.1 Emergency Power Supplies

- Provide electrical schematics relating to the PORV's and block valves and the pressurizer heater connections.

- Which pressurizer heaters are load shed on a safety injection signal? On a loss of power signal?

RESPONSE Enclosed are the following electrical schematics related to the PORVs, block valves and pressurizer heaters

10905-12	Rev 2
10905-89	Rev 1
10905-90	Rev 0
10905-240	Rev 0
10905-271	Rev 1
10905-280	Rev 1
10905-295	Rev 1
10905-433	Rev 1

Both the control and backup groups of pressurizer heaters are load shed on a safety injection signal and an undervoltage signal.

2.1.3.a Direct Valve Indication

- Is the valve position indicator safety grade? What is your schedule to update to safety grade standards?

- Is the valve position indicator seismically qualified? What is your schedule to upgrade the seismic qualifications?

RESPONSE Valve position indication system components located within containment (i.e. limit switches, LVDTs, and cable) are qualified to withstand accident environments. The present valve position indicators located in the Control Room are fabricated from commercial grade high quality solid state components. The actual indicator of valve position is comprised of light emitting diodes. Experience has shown that similiar electronic equipment has the capability of functionally withstanding the effects of the safe shutdown earthquake. Based on these facts and the commercial unavailability of fully qualified power supply and indication equipment for our position indication system, we feel that our system meets the functional requirements.

2.1.3.b Instrumentation of Inadequate Core Cooling

- What are the temperature and pressure inputs to the plant computer? How many inputs are there?
- Can the computer compute a margin to saturation?

RESPONSE There are two basic systems of subcooling monitoring at Ginna. The first system is a narrow range, (1750-2500 psig and 500-700°F), analog based system. It consists of two independent channels of subcooling margin computation, indication and alarming. Each channel has as inputs hot leg temperature and reactor coolant system pressure. The indication provided in the Control Room by each channel is the actual subcooling margin ($T_{sat}-T_{hot}$). The second system is a wide range system which utilizes the capabilities of the existing plant computer system. The computer has as inputs incore thermocouples and wide range reactor coolant system pressure. These inputs are therefore separate and diverse from those inputs to the narrow range system. This wide range system, therefore, allows monitoring of the reactor coolant system subcooling margin over the normal ranges of pressure and temperature. As with the narrow range system, the wide range system computes the margin to saturation, and alarms if this margin is less than the predefined limit.

Subcooling Meter

- What are the qualifications of the subcooling meter? What is your upgrade schedule?
- Do you have redundant safety grade temperature inputs on each hot leg? What is your upgrade schedule?
- What is your schedule to upgrade the temperature range to 300-700°F?
- Do you have redundant safety grade pressure inputs? What is your upgrade schedule?
- What is your schedule to upgrade the pressure range to 15-2500 psia?

RESPONSE The analog components are qualified to IEEE-323-1974 and IEEE-344-1975.

The narrow range subcooling margin monitoring system, as described in the response to the first question in 2.1.3.b above, consists of two separate, redundant, safety grade channels. Each channel monitors, via a single existing resistance temperature detector, its own hot leg temperature. Redundancy is provided by the independent channels, both of which continuously monitor similar reactor conditions.

Our wide range computer monitor includes the 300-700°F range.

Each channel of the narrow range system, has an independent pressure signal input derived from an existing safety grade pressure transmitter. The wide range computer monitor has pressure input from yet another pressure transmitter.

Our wide range computer monitor includes the 15-2500 psia range.

2.1.4 Containment Isolation

- Provide a typical isolation valve control circuit diagram that shows your proposed modifications.

RESPONSE A system modification has been designed to provide for individual resetting of all isolation valves to eliminate any possibility of an inadvertent opening. The modification will provide an additional reset requirement, for each individual valve, in the following way: (refer to drawing 03021-231 enclosed).

Upon receiving a containment isolation signal existing relay C picks up and opens normally closed contact C. This in turn removes power from, and deenergizes new relays R1-X, R1-Y, R2-X and R2-Y.

When containment isolation is reset contact C will reclose. For each X-Y pair of new relays there is a pushbutton in the control room. Upon pushing the PB the X & Y relays are energized. Contacts from each relay close (R1-X1 and R1-Y1 for example) sealing in the relays until another C. I. signal.

Contacts from the relay pair are used to light visual indicators behind the pushbutton so that relay actuation can be verified from the control room. A third pair of contacts (e.g. R1-X3, R1-Y3) are used to replace a single set of contacts in the existing CI logic. Redundant contacts and relays are used to assure that CI valves can be reopened, if required, even with a single relay or contact failure.

2.1.5 Hydrogen Control

- Provide a sketch of the fuel supply system for the internal recombiner system.
- Provide a description of the internal recombiner system.
- Provide the procedures for use of the recombiners.

RESPONSE Drawing 33013-819 Revision 0 shows the fuel system for the recombiners. Enclosed is Appendix 6D from the Ginna FSAR which describes the recombiner system. Additional details are given in WCAP 9001, "A Controlled Combusion System to Prevent Hydrogen Accumulation Following a Loss of Coolant Accident", February, 1969, Westinghouse Proprietary.

The following procedures deal with the Ginna Hydrogen Recombiner System:

S-21.1	1A	H_2 Recombiner Purging and Operation
S-21.2	1B	H_2 Recombiner Purging and Operation

2.1.6.a - Provide the preventative maintenance program described in Section 2.1.6.a of your December 28, 1979 letter.

- NUREG-0578 requires the licensee to implement all practical leak reduction measures and to measure and report actual system leakage rates. Your December 28, 1979 letter contains leakage rates for containment isolation, valves, secondary isolation valves and containment penetration, but not for the remainder of the affected systems. Therefore, provide total system leakage rates for those systems specified in Table 2.1.6.a of your December 28, 1979 letter.

RESPONSE The Ginna Preventative Maintenance Program is described by the following procedures which are enclosed:

A-53	Preventive Maintenance Program
A-53.1	Equipment Inspection Period and Lubricant List
A-53.2	Three Month Lubrication and Maintenance Inspection
A-53.3	Valve Preventive Maintenance Program

The results of leak rate tests reported in Tables 2.1.6.a.2, 2.1.6.a.3, and 2.1.6.a.4 of our December 28, 1979 response were for primary and secondary containment penetration leakage rates obtained throughout 1979. These leakage rates were determined as part of the In-Service Inspection, Technical Specifications, and Appendix J to 10CFR50 testing requirements and not from special tests as a result of the Lessons Learned requirements.

All systems noted in Table 2.1.6.a.1 of our response have been inspected to determine their actual leakage rates. Hydrostatic pressure tests were not performed on these systems since the NRC requirements were for leak rate determinations with the systems in operation. Operational tests were performed on the Residual Heat Removal, Safety Injection, and Containment Spray Systems. Liquid leakage was unmeasurably small. Boron accumulation was observed on several components within these systems. The affected

components were cleaned and a followup inspection was performed. A list of components showing new boron accumulation was forwarded to our Maintenance Department for subsequent action. Maintenance will be performed on these components during our 1980 Annual Maintenance and Refueling Shutdown.

The radioactive Liquid Waste System, Chemical and Volume Control System, and Primary Sampling System were also inspected. Liquid leakage was unmeasurably small. Boron accumulation was observed and similar action, as noted above, was taken.

The radioactive Waste Gas System was inspected by Nuclear Consulting Services, Inc. using a hydrogen detector method to determine leakage rates. In-field calculations estimated the rate as 6.91×10^{-2} cc/sec. This value was reported in our December 28, 1979 response. In a formal report received from Nuclear Consulting Services, Inc. on January 28, 1980 the total leakage for the entire system was calculated to be 2.297×10^{-3} cc/sec. This leakage rate is less than previously reported. Furthur inspections and determinations of leakage rates will be included in surveillance schedules at a frequency not to exceed refueling cycle intervals.

2.1.7.b - Provide electrical schematic showing power supplies to AFW flow meters.

RESPONSE During the present refueling outage, an Engineering modification will be designed and installed, to further enchance the redundancy in the power supplies for the AFW flow indication. Attached are two one-line diagrams (sketch 1 and sketch 2) showing the configuration that will be installed.

2.1.8.a - Provide the procedures implemented for post-accident sampling of primary coolant and containment atmosphere (i.e., PC 23.1 and PC 23.2).

RESPONSE The following procedures were implemented for post-accident sampling of primary coolant and containment atmosphere as noted in our response.

PC-23.1	Emergency Sampling of Primary Coolant
PC-23.2	Containment Atmosphere Sampling and Analysis During Containment Isolation

The following procedures for boron and chloride analysis on highly radioactive samples were referenced in our October 17, 1979 response.

PC-14	Potentiometric Determination of Boron
PC-18.1	Chloride Determination

An additional procedure for primary coolant sampling is included for your information.

PC-4 Hydrogen Concentration and Radiogas Activity in Primary Coolant Sampling and Analysis

2.1.8.b

- Provide the interim procedure for estimating noble gas effluents from the plant stack (PC 23.3).
- Provide assurance that all potential release points are monitored, including condenser air ejector and steam safety and relief valves.
- Provide a list of the individual system and area ventilation sources which exhaust through the stack.
- If the present procedures do not adequately monitor all release points, procedures must be developed and equipment must be designated which will assure they are. Include all necessary information as specified in the October 30, 1979 Denton letter for any new instrumentation.
- Provide the procedures for monitoring of radioiodine releases from the plant vent (HP-11.2). Provide assurance that this procedure will be adequate in an accident situation.
- Your response does not indicate that a procedure exists for estimating particulate releases. Provide the information requested in the October 30, 1979 Denton letter for estimating particulates (include the procedures which address this item).

RESPONSE The following procedure was developed for estimating noble gas effluents in the plant vent as noted in our response.

PC-23.3	Estimation of Noble Gas Release Rate from the Plant Vent During Accident Conditions

The following additional procedures are included for your information:

HP-1.4	Noble Gas Exposure
HP-11.3	Noble Gas Sampling and Analysis Utilizing a Marinelli Beaker
HP-11.11	Gas Sampling and Analysis Utilizing a 35 cc Glass Bulb

Attachment I is a list of the radiation areas which exhaust through the plant vent. Also enclosed is a copy of the HVAC flow diagram showing these areas.

The condenser air ejector is monitored and alarmed in the Control Room. In addition, the following procedure can be used for obtaining samples from the condenser air ejector.

HP-9.3 Air Ejector Gas Sampling

Subsequent to a steam generator tube rupture, if the primary system is not depressurized and the secondary system is isolated by the main steam isolation valves, a small release could occur through the atmospheric dump valves, the steam generator safety valves, or the steam supply to the turbine driven auxiliary feed water pump.

In order to detect and measure such a release, a radiation monitor location will be established adjacent to the main steam piping, upstream of the auxiliary feed pump supply and the safety and atmospheric dump valves. Procedures will be established for placing portable monitors at these locations when plant conditions require it.

The following procedures are used for monitoring radioiodine releases from the plant vent.

HP-11.2	Iodine in Air - Charcoal Cartridge Method
RD-3	Plant Vent Iodine and Particulate Releases Sampling and Analysis

These procedures have been reviewed by our Health Physics Department and are considered acceptable for accident monitoring.

The following procedures are available for estimating particulate releases.

HP-11.2	Iodine in Air-Charcoal Cartridge Method
HP-11.4	High Volume Air Sampling
RD-3	Plant Vent Iodine and Particulate Releases Sampling and Analysis

2.1.8.c - Provide a description of your system/method to be used to determine radioiodine concentrations in occupied areas. Assure that prompt analysis of samples can be obtained. Assure that all vitally occupied areas will be monitored. Provide the plant procedures which assure implementation of this item.

RESPONSE Radioiodine concentrations in the auxiliary building are determined by portable constant air monitors (CAMs) located throughout the auxiliary building. Portable air samplers are available for use in other parts of the plant. The CAM's have local alarms (i.e. immediate analysis) and monitor the air for radioiodine, gas, and particulates. The CAM's utilize a single channel analyzer calibrated to the I-131 energy.

The portable air samplers are available in the Health Physics area and the Emergency Survey Center and can be placed in any location for monitoring. The portable air samplers have charcoal and silver zeolite iodine collectors. Measurements are determined in a low background, low contamination counting facility. Samples can be purged of noble gases to assure accurate iodine measurements. HP technicians are trained in sample analysis. The following procedures are used for analysis.

HP-11.2	Iodine in Air - Charcoal Cartridge Method
HP-11.10	Air Sampling with Siersat Low Volume Air Sampler

Plant procedure SC-1.3D (not included), Manning of the Technical Support Center, is being revised to assure that this area will be monitored for radioiodine concentrations. Areas requiring occupancy will be monitored as per standard radiation protection measures.

2.2.1.a Shift Supervisor Responsibilities

2.2.1.b Shift Technical Advisor

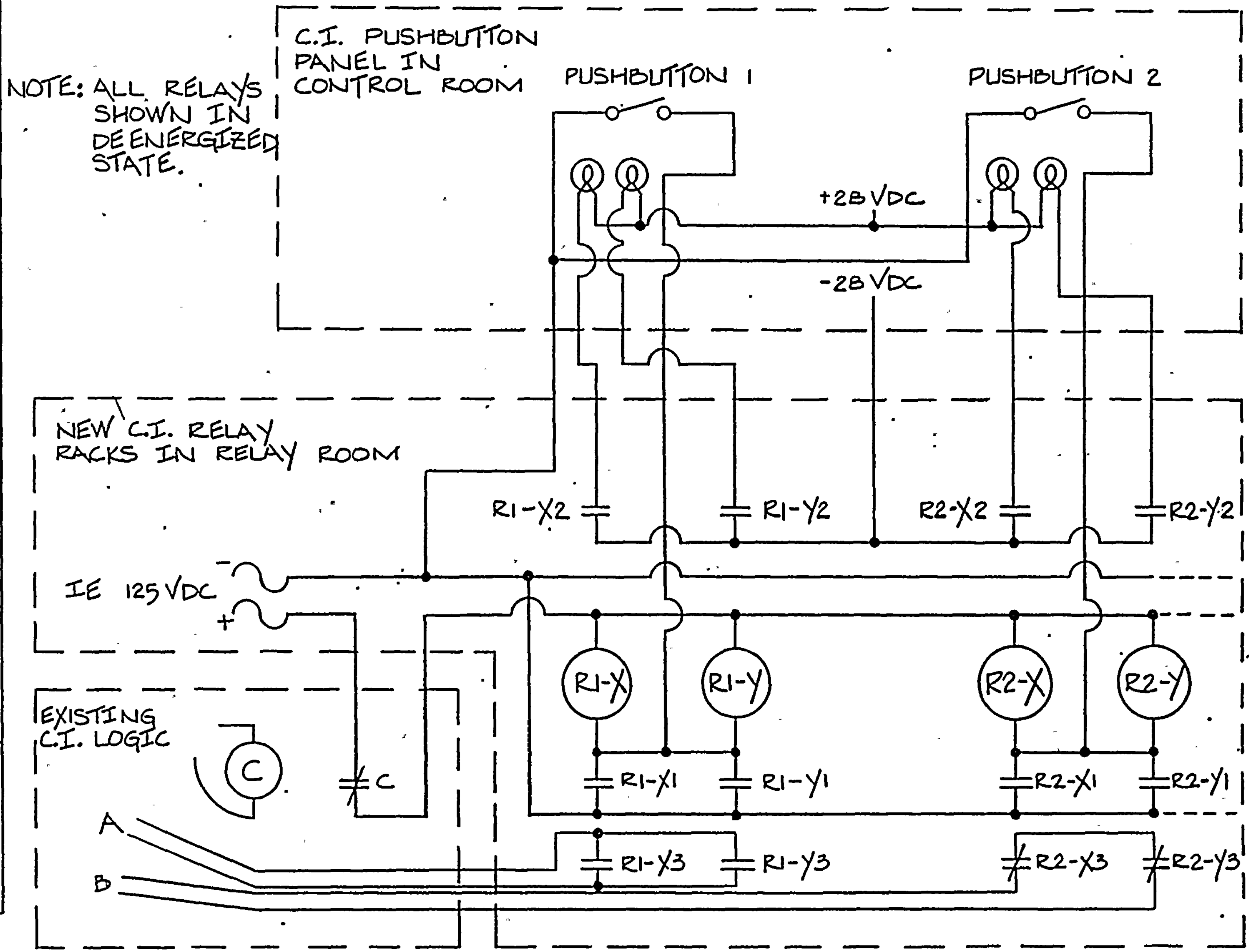
2.2.1.c Shift Turnover Procedure

- Provide a copy of the management directives, plant operating procedures, logs and checklists related to the above NUREG-0578 2.2.1.a through c requirements. All documents referenced in your November 19 and October 17 submittals should be submitted for staff review.

RESPONSE Enclosed is a copy of the management directive regarding Shift Supervisor's Responsiblities which was sent to the NRC Office of Inspection and Enforcement, Region I. The following procedures are enclosed:

A-25	Reporting of Unusual Plant Conditions
A-52.1	Shift Organization and Responsibilities
A-52.1.4	Health Physics and Chemistry Shift Changeover
A-52.4	Control of Limiting Conditions for Operating Equipment
A-52.5	Control of Limiting Conditions for System Specifications
A-54.4	Duty Engineer Responsibilities
A-201	Ginna Station Administrative and Engineering Staff Responsibilities
0-6.13	Daily Surveillance Log
0-9	Shift Relief Turnover - Control Room
0-9.1	Shift Relief Turnover - Auxiliary Operators

Procedure 0-6.2, Main Control Board Status, referenced in our December 28, 1979 response has been incorporated into 0-6.13, Daily Surveillance Log.



GAS & ELECTRIC CORP.
ROCHESTER, NEW YORK

EWR 2605
C.I. LOGIC DIAGRAM

	INITIAL	DATE
ORIGINAL		
REVISION		
DRAWN BY	DEL	3-31-80
CHECKED BY	[illegible]	3/31/80
RESP. ENG.	[illegible]	3/31/80
ENG. MANG'R.	[illegible]	4/1/80

SCALE

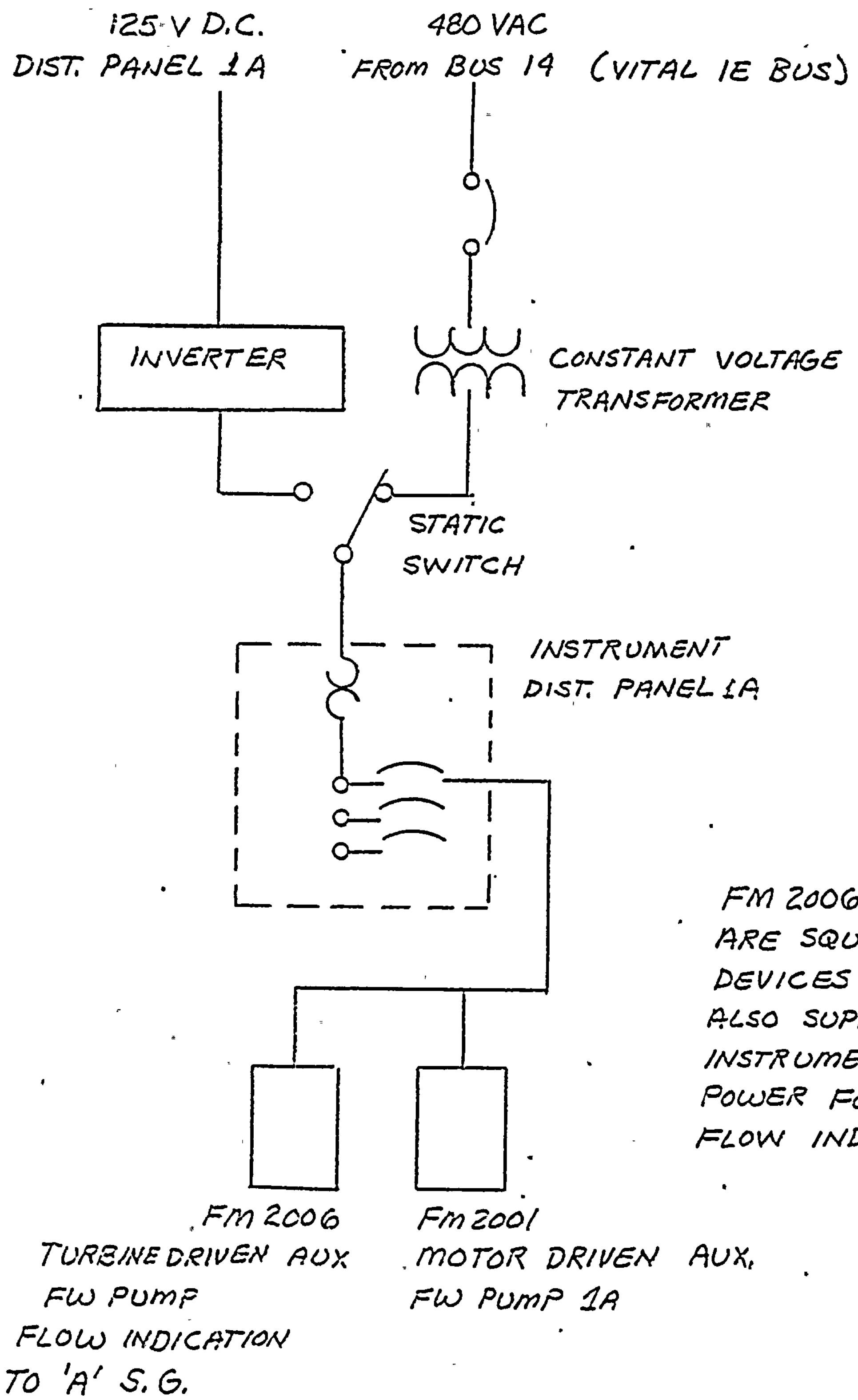
NO. 03021-231

ROCHESTER GAS AND ELECTRIC CORPORATION

42-33

ENG. DEPT.	STATION: GINNA STATION	DATE: 04-03-80	PAGE 1 OF 2
JOB: POWER SUPPLY FOR AFW FLOW IND.		MADE BY: CJD	CK:

SKETCH #1 (REF.: QUESTION 2.1.7.b)



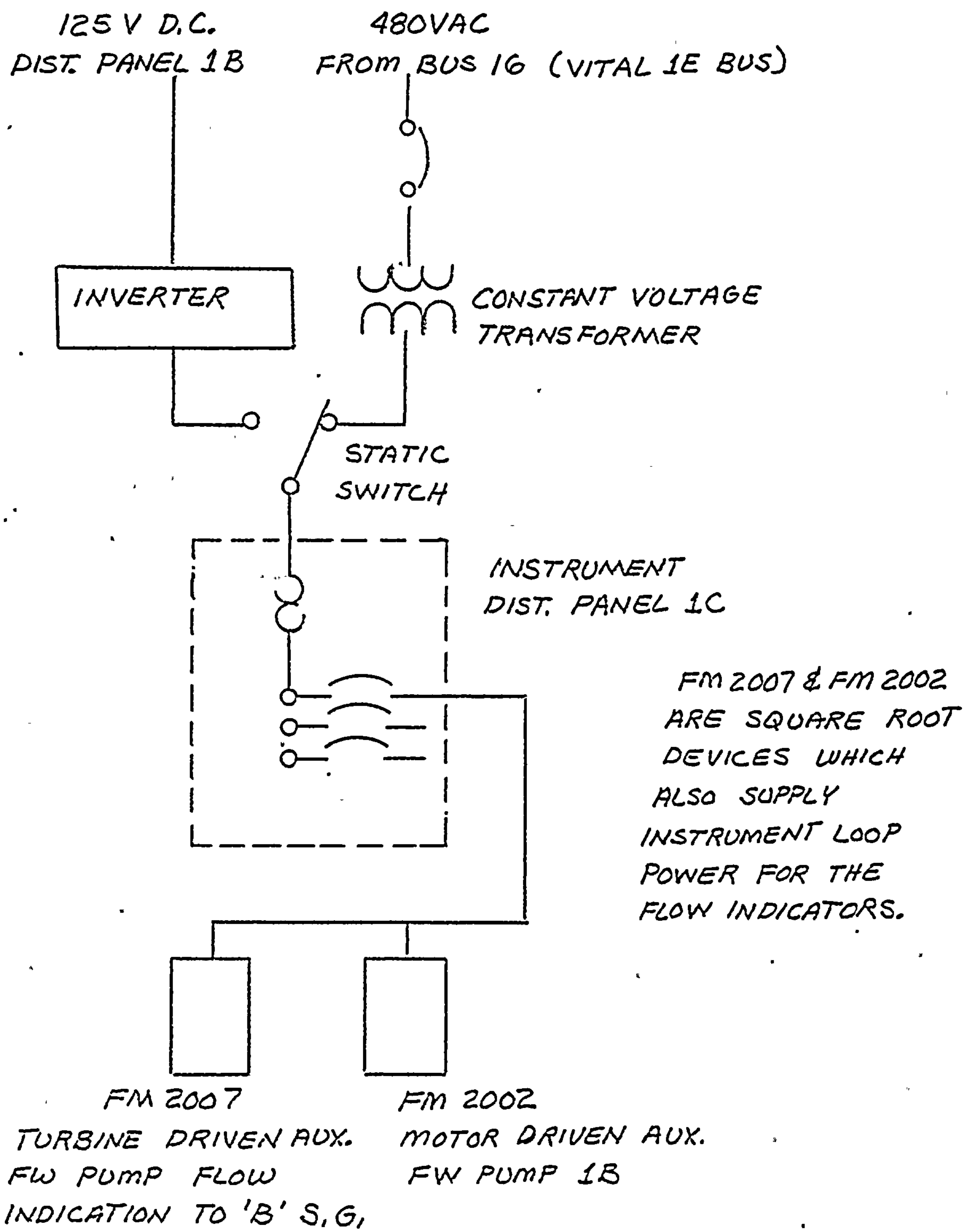
FM 2006 & FM 2001 ARE SQUARE ROOT DEVICES WHICH ALSO SUPPLY INSTRUMENT LOOP POWER FOR THE FLOW INDICATORS.

ROCHESTER GAS AND ELECTRIC CORPORATION

42.33

ENG. DEPT.	STATION: GINNA STATION	DATE: 04-03-80	PAGE 2 OF 2
JOB: POWER SUPPLY FOR AFW FLOW IND.		MADE BY: CJD.	CK:

SKETCH #2 (REF.: QUESTION 2.1.7.b)



ATTACHMENT I

LAUNDRY
SHOWERS
COUNT ROOM & HP MONITOR ROOMS
RADIO CHEMISTRY LABS
SAMPLE ROOM
WATER ANALYSIS LAB
CONTROL ACCESS AREA
HOT SHOP
WASTE EVAPORATOR VENT/AIR EJECTOR DISCHARGE
LEAKOFF COLLECTING TANK
RHR PUMP PIT
RHR HX PUMP PIT
GAS DECAY TANK
BORIC ACID EVAP./AIR EJECTOR DISCHARGE
WASTE HOLDUP TANK AREA
CHARGING PUMP AREA
CONCENTRATE HOLDUP TANK & PUMP
VOLUME CONTROL TANK & REACTOR COOLANT FILTER
DEMINERALIZER ION EXCHANGERS
SEAL WATER HEAT EXCHANGER
NON-REGENERATIVE HEAT EXCHANGER
GENERAL INTERMEDIATE FLOOR AREA
PIPE SPACE
CONTAINMENT SPRAY PUMP
SPENT RESIN STORAGE TANK
SPENT RESIN REMOVAL STORAGE AREA
GENERAL BASEMENT AREA
BORIC ACID EVAPORATOR TRAIN
GAS STRIPPER
GAS COMPRESSOR
HOLDUP TANKS
SPENT FUEL PIT FILTER
GENERAL OPERATING FLOOR AREA
BORIC ACID TANK AREA
DRUMMING STATION
SPENT FUEL STORAGE AREA
DECONTAMINATION PIT
NEW FUEL STORAGE AREA
INTERMEDIATE BUILDING AREAS
SAFETY INJECTION PUMPS

APPENDIX 6D

DESIGN INTENTIONS REGARDING THE USE OF A HYDROGEN RECOMBINER SYSTEM IN THE R.E.GINNA PLANT CONTAINMENT

As stated in Appendix 6B of the FSAR, the R.E. Ginna containment will incorporate two recombiner units. The purpose of these units is to prevent the uncontrolled post-accident buildup of hydrogen concentrations in the containment, approaching or exceeding a potential explosive condition.

To elaborate further on the design basis and analysis of the system providing hydrogen removal capability, the following information is submitted.

1. DESIGN BASIS H_2 FORMATION RATE

The post-accident hydrogen formation mechanisms and assumptions made for estimating the maximum yield of each are summarized in Appendix 6B. A more rigorous calculation of the yield from core gamma absorption has been made, permitting a reduction in that source. Curves A and E of Figure 6B-1 reflect this change. Specific radiolytic yield from core gammas remain at 0.44 molecules per 100 ev, however the inventory of long-lived gamma emitters in the fuel has been adjusted to represent a true burnup cycle.

In addition, Figure 6B-1 (Revised 1-69) includes the results of a comparative calculation in which gamma energy deposition in the fuel and water of the core region is based on a lumped model rather than a homogeneous model. These results are shown as curves A' and E'. Since this model is more nearly representative of the physical system, the lower yield curve obtained in the lumped model is apt to be more realistic. By this method, the lower

flammability limit would be reached in 31 days, rather than in 19 days by the homogeneous model (revised sources), or in 10 days as originally reported.

Other sources in the analysis are not changed in the revision.

2. DESCRIPTION OF THE RECOMBINER SYSTEM CONCEPT

The recombiner system consists of two full-rated subsystems, each capable of maintaining the ambient H_2 concentration at 2 v/o. Each subsystem contains a combustor, fired by an externally supplied fuel gas, employing containment air as the oxidant. Hydrogen in the containment air is oxidized in passing through the combustion chamber. Hydrogen gas is also used as the externally supplied fuel in order that non-condensible combustion products are avoided which would cause a progressive rise in containment pressure. Oxygen gas is made up through a separate containment feed to prevent depletion of O_2 below the concentration required for stable operation of the combustor.

Each recombiner is equipped with an air supply blower to deliver primary combustion air and quench air which reduces the unit exhaust temperature, an ignition system and associated monitoring and control instrumentation. The system is designed to operate at ambient steam overpressures corresponding to 0-5 psig in the containment, and to withstand the design basis transient environment prior to operation. It can be periodically tested during plant operation.

A report containing details of the design is being prepared for submittal. An analysis of performance and sensitivity to changes in operating parameters is also in preparation, based on proof tests performed on the prototype combustor. This analysis is presented in WCAP-9001, "A Controlled Combustion System to Prevent Hydrogen Accumulation Following a Loss of Coolant Accident," February, 1969, W Proprietary.

3. SUPPLY OF FUEL GAS FOR RECOMBINER OPERATION

Hydrogen fuel for the recombiners is stored in small quantities (standard gas cylinders) sufficient for periodic testing. These cylinders are not connected to the fuel supply headers except during the test and in accordance with test procedures.

In the event of its need following an accident, hydrogen fuel would be brought to the site to permit starting the process by the fifth day. This schedule would prevent H_2 from reaching 2 v/o in the containment when calculated by the more conservative (homogeneous) energy deposition model. Subsequent operation will require an average fuel consumption of 8100 SCF per day over the next 60 days, and about half as much oxygen, to maintain the ambient H_2 at 2 v/o. Bulk gas would be delivered in trailer mounted tubes at 60-80,000 SCF per load, requiring about eight such deliveries of H_2 during that 60 day period, and four similar deliveries of O_2. Consumption would be more rapid than the average rate during the early phase and less rapid later, due to the decay of the radiolysis source.

4. ALTERNATIVES TO OPERATION OF THE RECOMBINER

Venting of the containment atmosphere prior to accumulation of an explosive mixture of hydrogen in the containment would obviate dependence on the recombiner, provided the radioactive constituents of the atmosphere can be trapped or safely dispersed in the environment. An assessment of this procedure for use at the RGE site leads to the following conclusions.

a. Venting must be accomplished before 6 v/o H_2 is accumulated. A higher concentration, if accidentally ignited, could result in dynamic overpressures capable of damaging the containment.

b. A concentration of 5.5% v/o could be attained in about 31 days, by the conservative homogenous model. In the same time period, the more realistic lumped model predicts a concentration just equal to the lower flammable limit of 4.1 v/o.

c. Favorable meteorological conditions and/or protective action is behalf of the nearby population would reduce the possible dose from venting the airborne activity at 31 days to an acceptable level. Assuming all of the noble gases and the non-removable fraction (2.5% of the core inventory) of halogens to be airborne the dose to an individual at the low population zone distance of 4.8 km (3 mi) during passage of the cloud is calculated to be 0.17 rem whole body, and 1.8 rem thyroid. Persons nearer than 4.8 km would be required to be evacuated, and dispersion conditions corresponding to Pasquill B and a 12 mph wind obtained in order to achieve this estimate of maximum exposure.

It is concluded that proper protection of the health and safety of the public is served by providing the recombiner system, thus avoiding the necessity of venting at any specific time. However, the study reported above indicates that an alternative means exists of avoiding a serious hazard by controlled venting if for any reason the recombiner were not operable.

ROCHESTER GAS AND ELECTRIC CORPORATION • 89 EAST AVENUE, ROCHESTER, N.Y. 14649

LEON D. WHITE, JR.
VICE PRESIDENT

TELEPHONE
AREA CODE 716 546-2700

December 13, 1979

Mr. Boyce H. Grier, Director
U. S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region I
631 Park Avenue
King of Prussia, Pennsylvania 19406

Subject: Shift Supervisors Responsibilities
R. E. Ginna Nuclear Power Plant, Unit No. 1
Docket No. 50-244

Dear Mr. Grier:

In response to the July 18, 1979 TMI-2 Lessons Learned Task Force Status Report and short-term Recommendations and Mr. Harold R. Denton's October 30, 1979 letter giving further clarification on the TMI Lessons Learned Short Term requirements, I have issued a directive to Ginna Station personnel on the Shift Supervisor's Responsibilities (attached).

Very truly yours,

L D White, Jr.

L. D. White, Jr.

Att.

Rochester Gas and Electric Corporation

Inter-Office Correspondence

December 13, 1979

SUBJECT: Shift Supervisor's Responsibilities

To: Ginna Station Personnel

As directed by the United States Nuclear Regulatory Commission in the Lessons Learned Short Term Requirements, it is to be emphasized, as it has always been understood at our Ginna Station, that the shift foreman, henceforth to be designated the shift supervisor, has the primary management responsibility for the safe operation of the plant under all conditions on his shift.

It is intended that the shift supervisor maintain the broadest perspective of operational conditions affecting the safety of the plant as a matter of highest priority at all times. This is to say that the shift supervisor should not become totally involved in any single operation in times of emergency when multiple operations are required in the control room. The shift supervisor, until properly relieved, shall remain in the control room at all times during accident situations to direct the activities of the control room operators. The control room, as used herein, has been defined to include the shift supervisor's office.

In the temporary absence of the shift supervisor from the control room, the head control operator shall assume the shift supervisor's responsibilities of command of the control room and the incumbent charge for safe operation of the plant. As delineated in the past, the authority and responsibility to perform the necessary actions to reduce load or shut down the plant can be exercised by any licensed operator on the shift in the event of unusual or abnormal operating conditions.

Procedures are being revised to emphasize these charges, clarify the shift personnel duties, responsibilities and authority, formalize the shift turnover for proper relief and turnover of authority for all shift positions and for proper documentation of such compliance.

All of these statements reaffirm to a large extent the practice that has developed with experience at the station, the same experience which has made our station a very respected and successful one. Your cooperation and continued dedication to these requirements will keep it so.

L D White, Jr.

L. D. White, Jr.

GINNA STATION
UNIT #1
COMPLETED

DATE:-

TIME:-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-25 REV. NO. 8

REPORTING OF UNUSUAL PLANT CONDITIONS

TECHNICAL REVIEW

PORC 3/3/80

TRSchuler
QC REVIEW

3-5-80
DATE

APPROVED FOR USE

Bruce A Snow
PLANT SUPERINTENDENT

3-5-80
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 3 PAGES

ADMINISTRATIVE PROCEDURE A-25

REPORTING OF UNUSUAL PLANT CONDITIONS

1.0 PURPOSE:

1.1 To define duties, responsibilities and lines of communications in the event that plant personnel observe or become aware of unusual plant operating conditions or potential violations of Technical Specifications.

1.2 To assure continuous plant surveillance, prompt evaluations and assessment of conditions, early documentation of events, and to assure that the appropriate people are immediately notified of said conditions.

1.3 This administrative order is limited to actions required by plant personnel. It is intended to apply primarily to early actions of individuals. If the condition or event is covered by an established emergency or operating procedure, personnel will be guided by the instructions in the specific procedure.

2.0 REFERENCES:

2.1 Facility Technical Specifications, Section 6.6

2.2 Facility Safety Analysis Report

2.3 Code of Federal Regulations 10CFR20

2.4 Nuclear Regulatory Commission Reg. Guide 10.1

2.5 A-25.1, "Ginna Station Event Report"

2.6 A-52.4, "Control of Limiting Conditions for Operating Equipment"

2.7 A-52.5, "Control of Limiting Conditions for Systems Specifications"

2.8 O-9.3, NRC Immediate Notification

3.0 INSTRUCTIONS:

3.1 All Personnel

3.1.1 Any individual, who observes or is aware of an unusual condition or potential Tech. Spec. violation shall immediately report the condition and circumstances to his supervisor and the Shift Supervisor. The following are examples of reportable events; reactor trip, forced power reduction or outage, radiation exposure, unplanned radioactive material release, equipment malfunction or system degradation, reactor coolant leakage, reactivity anomaly or violating a limiting condition for operation. Refer to Tech. Spec. section 6.6 and O-9.3 for more detailed definitions.

3.1.2 The individuals or persons involved will be expected to observe and note the time and conditions associated with the event. Event times, data and observations shall be recorded during the event or as it progresses. These notes and observations will aid in making subsequent report, "Ginna Station Event Report" A-25.1.

3.2 Shift Supervisor

3.2.1 The Shift Supervisor will be responsible for:

3.2.1.1 Making a preliminary assessment of the significance of all unusual conditions reported to him.

3.2.1.2 Directing activities of all plant personnel under his cognizance to maintain a safe plant status.

3.2.1.3 Notifying the duty engineer of conditions which require reporting. (Plant trip, Tech. Spec. violation must be reported immediately).

The duty engineer must be notified by phone if he is not present on shift. (See current duty schedule)

The duty engineers alternate is the staff engineer scheduled for duty on the following week.

3.2.1.4 Notifying the appropriate maintenance foreman and requesting other assistance as needed.

Any failure of safeguards equipment requires immediate maintenance attention.

3.2.1.5 Notifying Health Physics in the event if a radiation exposure incident or unplanned effluent release.

3.2.1.6 Assuring that appropriate operating data and records are maintained during and following the event.

A sequential listing of event times, commands, operator actions and event descriptions will be maintained in the official record. The head control operator will normally assume responsibility for this function.

3.2.1.7 Submitting Procedure A-25.1, "Ginna Station Event Report" relating to the event or condition to the duty engineer and copies to the operations engineer and Q. C. Engineer.

3.2.1.8 Evaluate need to notify the NRC within one hour by telephone. See O-9.3 for Instructions.

3.3 Duty Engineer

3.3.1 The duty engineer will be responsible for:

3.3.1.1 Making a preliminary assessment of the significance of the event or conditions reported to him.

3.3.1.2 Assisting and/or obtaining assistance to correct the condition and secure or restore the plant to a safe operating status.

3.3.1.3 Notifying the following individuals in the event of a plant trip or potential Tech. Spec. violation.

3.3.1.3.1 Plant Superintendent.

3.3.1.3.2 Assistant Plant Superintendent.

3.3.1.3.3 Vice-President, Electric and Steam Production (Only if Superintendent or Assistant Superintendent is not available).

3.3.1.4 Conducting the required investigation of the problem until relieved or the responsibility is assigned to someone else.

3.3.1.5 Notifying the operations engineer of conditions as soon as possible.

3.4 Plant Superintendent (or alternate)

3.4.1 Will schedule and chair a PORC Meeting to determine if a Technical Specification violation has occurred, a hazardous plant condition exists, or the event is reportable to the NRC under 10CFR21.

3.4.2 Will notify the following if a violation of the Plant Technical Specifications has occurred.

3.4.2.1 Vice-President, Electric and Steam Production.

3.4.2.2 Nuclear Regulatory Commission - Division of Regulatory Operations.

3.5 Maintenance Engineer

3.5.1 The Maintenance Engineer will be responsible for assembling the necessary crews, tools and equipment which may be required to effect repairs.

3.6 Control Room and Auxiliary Operators

3.6.1 Mark time, date and initials on appropriate charts as important events occur to aid in the analysis of the event.

3.7 Operations Engineer

3.7.1 Direct restoration of the plant to the proper operating or shutdown mode as required by Tech. Specs.

3.8 Quality Control Engineer

3.8.1 Review the event and initiate a Corrective Action Report, if required.

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-52.1 REV. NO. 8

SHIFT ORGANIZATION AND RESPONSIBILITIES

TECHNICAL REVIEW

PORC 12/21/79

Mark Shaw
QC REVIEW

12-28-79
DATE

APPROVED FOR USE

Bruce A Snow
PLANT SUPERINTENDENT

12 28 79
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 4 PAGES

A-52.1

SHIFT ORGANIZATION AND RESPONSIBILITIES

1.0 PURPOSE:

1.1 To establish the shift organization by which the Plant shall be operated, the requirements for Control Room Operations, the minimum Plant personnel requirements, and the line of authority and responsibility in the Control Room during emergency conditions.

2.0 REFERENCES:

2.1 Technical Specification 6.2, Organization

2.2 Regulatory Guide 1.33

2.3 Regulatory Guide 1.114

2.4 IE Bulletin 79-06A and 79-06A Rev. 1

2.5 IE Bulletin 79-05C

2.6 IE Bulletin 79-06C

2.7 October 17, 1979 response to NUREG 0578, TMI-2 Short Term Lessons Learned

3.0 INSTRUCTIONS:

3.1 Personnel Requirements:

3.1.1 The minimum shift shall consist of a Shift Supervisor, a Shift Technical Advisor (when the Reactor is critical), a Head Control Operator, a Control Operator and two (2) Auxiliary Operators.

3.1.2 Substitutions may be made without changing the minimum total personnel requirements.

3.2 The following shift requirements shall be met:

3.2.1 At least one (1) licensed Reactor Operator shall be in the Control Room when fuel is in the reactor. (Tech. Specs., Figure 6.2.2b).

3.2.2 At least two (2) licensed Reactor Operators shall be present in the Control Room during reactor startup, scheduled reactor shutdown, during power operation and recovery from trips. (References 2.1, 2.5, 2.6).

3.2.3 Normal shift complement shall consist of at least six (6) persons, including one (1) licensed Senior Reactor Operator and three (3) licensed Reactor Operators. (Reference 2.1 and 2.7).

3.2.4 All core alterations shall be directly supervised by either a licensed Senior Reactor Operator or Senior Reactor Operator limited to fuel handling who has no other concurrent responsibilities during this operation..

3.2.5 An individual qualified in radiation protection procedures shall be on site when fuel is in the reactor as follows: (Technical Specification Section 6.2.2e).

3.2.5.1 The Health Physics Technician shall have this responsibility.

3.2.5.2 Radiation protection procedures shall be considered to be those described in A-1, Radiation Control Manual; A-1.2, Air Sampling Procedure; A-1.3, Smearing Procedure; and A-1.4, Radiation Survey Procedure.

3.3 Shift Schedule:

3.3.1 Shifts should rotate as per posted schedule in Control Room.

3.4 Control Room Operations:

3.4.1 All major Plant operations and activities shall be controlled from the Control Room in accordance with instructions from the Shift Supervisor.

3.4.2 The Shift Supervisor shall put into effect the orders he receives from the Operations Engineer or the Duty Engineer.

3.4.3 The Shift Supervisor shall be responsible for maintaining control of personnel in the Control Room, whether for observing reactor operation or directing the conduct of testing, or limiting access to the Control Room during emergency conditions.

3.4.4 The Shift Supervisor should generally use the Shift Supervisor's Office and the Control Room as his base locations for directing Plant operations. However, he may be anywhere within the site where he believes his attention should be directed.

3.4.5 In an accident condition, the Shift Supervisor will remain in the Control Room (Reference 2.7).

3.4.5.1 The Shift Supervisor may be relieved by another Shift Supervisor or individual maintaining a valid Senior Reactor Operators license (alternate). The relief and transfer of authority will be recorded in the Official Log.

3.4.5.2 The Shift Supervisor or alternate will maintain an overview of the entire situation, make decisions, and direct operations. He will not become totally involved in any single operation.

3.4.5.3 The Shift Supervisor or alternate will have the authority and responsibility to limit and restrict access of personnel to the Control Room. He may request additional personnel as required (See Attachment I).

3.4.5.4 The Shift Supervisor or alternate will have a clear line of authority and responsibility in the Control Room during emergency conditions as depicted in Attachment I.

3.4.6 When the Shift Supervisor is temporarily absent from the Control Room during routine operations, the Head Control Operator shall assume the Shift Supervisor's responsibilities of command of the Control Room and the incumbent charge for safe operation of the plant.

3.4.7 The Head Control Operator is in charge of the operation of the Control Room. He directs the activities of the Control operators and the non-routine activities of the Auxiliary Operators.

3.4.8 The Head Control Operator and Control Operator should normally be in the Control Room and shall be responsible for the direct operation of Plant controls and equipment and the maintaining of the Plant Operating Logs.

3.4.8.1 Either the Head Control Operator or the Control Operator should normally be in the area of the Control Room where visual surveillance of safety related annunciators and instrumentation can be performed. Both the Head Control Operator and the Control Operator may not be out of the area. In the event of an emergency, both the Head Control Operator and the Control Operator may momentarily be absent from the above area in order to verify the receipt of an alarm or initiate corrective action provided that both Operators remain within the Control Room. Either Operator may be temporarily relieved by another licensed Operator.

3.4.9 The Shift Technical Advisor should normally be in the Control Room, or be available in the Control Room within ten (10) minutes of being summoned whenever the reactor is critical. (Reference 2.7).

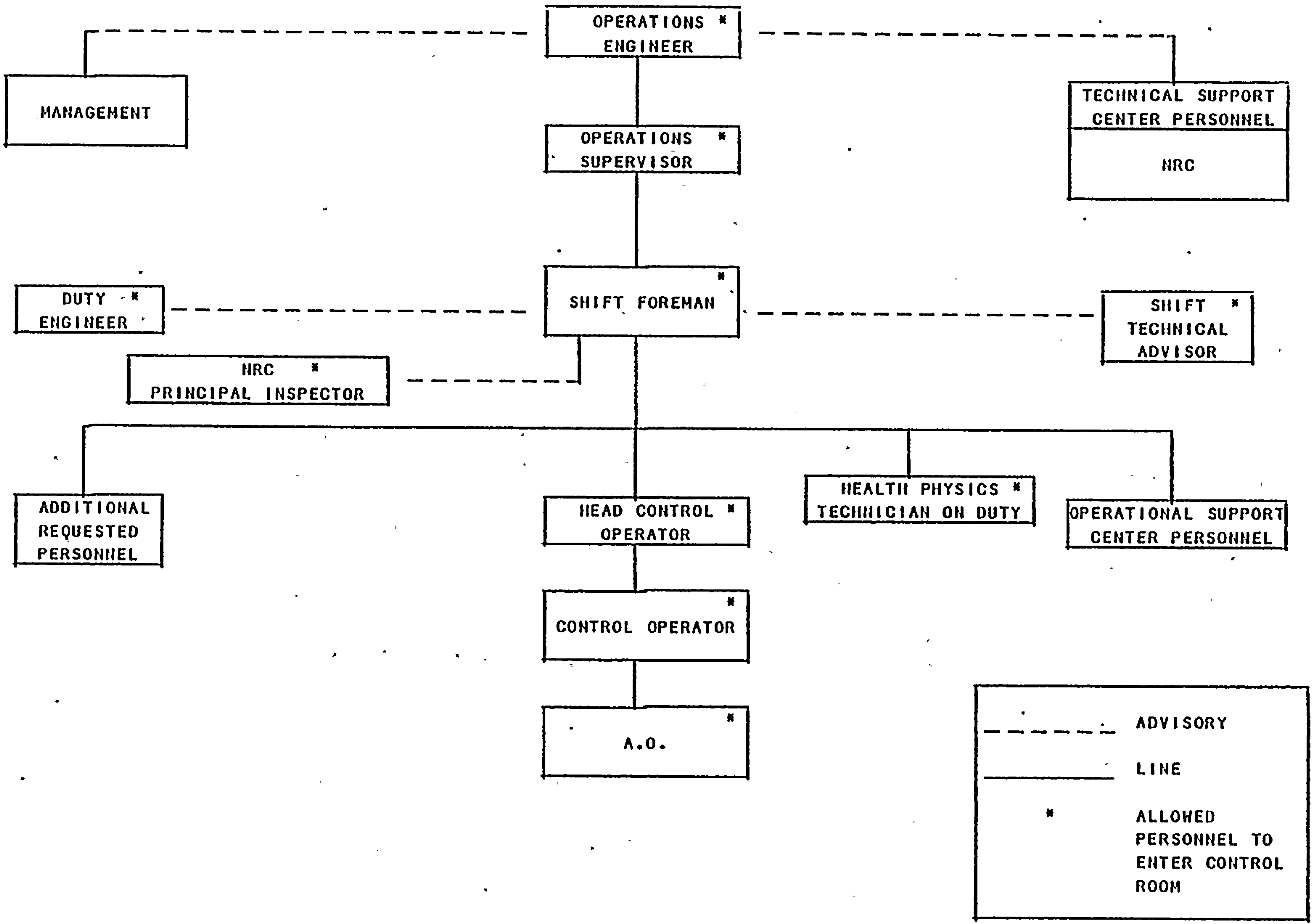
3.4.9.1 During normal plant conditions, the Shift Technical Advisor will perform the operational assessment function to maintain and upgrade safe plant operations.

3.4.9.2 During accident or off-normal plant conditions, the Shift Technical Advisor will aid in the recognition and diagnosis of off normal events and will act in an advisory capacity to the Shift Supervisor. The Shift Technical Advisor will be detached from manipulations of controls and from the immediate supervision of operators.

3.4.10 The two Auxiliary Operators should normally be within the site making tours to observe operating equipment, recording operating data and conducting routine operations and inspections.

3.4.11 The Operators in the Control Room may request the Shift Supervisor to direct any authorized personnel or visitors from the Control Room if they believe that the presence of the people may interfere with operations of the Plant.

3.4.12 The Shift Supervisor, Shift Technical Advisor, Head Control Operator or Control Operator in the Control Room have the authority and responsibility to perform whatever proper actions are required to <u>limit the operation of the Plant</u> or <u>shutdown the Plant</u> in the event of unusual or abnormal operating conditions.



(ATTACHMENT 1)

GINNA STATION
UNIT #1
COMPLETED

DATE:-

TIME:-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-52.1.4 REV. NO. 1

HEALTH PHYSICS AND CHEMISTRY SHIFT CHANGEOVER

TECHNICAL REVIEW

PORC JAN 7 1980

QC REVIEW DATE 1-16-80

APPROVED FOR USE

PLANT SUPERINTENDENT DATE 1-17-80

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ______

THIS PROCEDURE CONTAINS 2 PAGES

A-52.1.4

HEALTH PHYSICS AND CHEMISTRY SHIFT CHANGEOVER

1.0 PURPOSE:

1.1 To insure important information concerning HP and Chemistry status is passed on to the oncoming shift technician.

2.0 REFERENCES:

2.1 NUREG 0578 "Short Term Lessons Learned"

3.0 INSTRUCTIONS:

3.1 Review previous shift changeover checklist and initial.

3.2 Review Shift Log Book

3.3 Review Day Order Book and initial any new entries.

3.4 Check monthly and daily HP and Chemistry work schedules to determine scheduled duties.

3.4.1 If scheduled duties are not performed it should be noted on the checklist to insure oncoming shifts are aware of duty missed.

3.5 Check RMS system to insure monitors are operable and that there has been no major changes.

3.5.1 Check that there is proper sample flow to R-19, flow should be at least 25% of full scale.

3.6 Check instruments on the secondary sample to insure they are operating normally. Check recorder readings and sample flows noting if there have been any unusual changes.

3.7 Check instruments on the condensate polisher sample panel to insure they are operating normally. Check recorder readings and sample flows noting if there have been any unusual changes.

3.8 Chemical or radiochemical analysis which are out of specs. or unexplained changes noted in plant conditions should be reported to the Shift Supervisor for his evaluation.

Refer to A-52.1.4
for Instructions

HEALTH PHYSICS AND CHEMISTRY SHIFT CHANGEOVER CHECKLIST

3.1 Review previous shift check list. ________

3.2 Review Shift Log Book ________

3.3 Review Day Order Book. ________

3.4 Review monthly and daily work schedules. ________

REMARKS ________________________________

3.5 Check RMS System. ________

REMARKS ________________________________

3.5.1 Check R-19 Flow. ________

REMARKS ________________________________

3.6 Check Secondary Sample Panel. ________

REMARKS ________________________________

3.7 Check Condensaate Polisher Sample Panel. ________

REMARKS ________________________________

3.8 Information reported to Shift Supervisor. ________________

COMPLETED BY: ________________ DATE: __________ SHIFT HOURS: ________

REVIEWED BY: ________________

SUPERVISOR HP & CHEMISTRY: ________________

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-52.4 REV. NO. 21

CONTROL OF LIMITING CONDITIONS FOR OPERATING EQUIPMENT

TECHNICAL REVIEW

PORC 3/3/80

TRSchuler
QC REVIEW

3-5-80
DATE

APPROVED FOR USE

[signature]
PLANT SUPERINTENDENT

3-5-80
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 4 PAGES

A-52.4

CONTROL OF LIMITING CONDITIONS FOR OPERATING EQUIPMENT

1.0 PURPOSE:

1.1 To establish a method of controlling the time period for equipment not meeting the Limiting Conditions for Operations, during operating and hot shutdown modes, and to document operations is informed of safeguards equipment being removed from and restored to service.

2.0 REFERENCES:

2.1 Technical Specifications.

2.2 Procedure A-52.5, Control of Limiting Conditions for System Specifications.

2.3 NRC I & E Bulletin 79-06A.

2.4 0-9.3, NRC Immediate Notification.

3.0 INSTRUCTIONS:

3.1 If any of the below equipment is deemed inoperative, refer to Step 3.2.

3.1.1 Charging Pumps (2 of 3 required).

3.1.2 Boric Acid Pumps.

3.1.3 CVCS valves and piping.

3.1.4 Heat Tracing.

3.1.5 Safety Injection Pumps.

3.1.6 Residual Heat Removal Pumps.

3.1.7 Residual Heat Removal Heat Exchangers.

3.1.8 Safety Injection and RHR interlock, valves and piping.

3.1.9 Containment Spray Pumps.

3.1.10 Containment Recirculation Fan (4 of 4 required).

3.1.11 Post Accident Charcoal Filters.

3.1.12 Recirculation HEPA filters and demisters.

3.1.13 Containment Spray and Containment Fan Cooler valves and piping.

3.1.14 Component Cooling Water Pumps.

3.1.15 Component Cooling Water Heat Exchangers.

3.1.16 Component Cooling Water Interlocks, valves and piping.

3.1.17 34.5 KV - 4160 Volt Station Service Transformer.

3.1.18 Diesel Generators (Includes Diesel Generators Breakers).

3.1.19 Auxiliary Feedwater Pumps (3 of 3 required, > 350°F).

3.1.19.1 Standby Auxiliary Feedwater Pumps (2 of 2 required, > 350°F).

3.1.20 Service Water Pumps (2 of 4 required).

3.1.21 Service Water Loop Header (1 of 2 required), with flow path to all (5) Auxiliary Feedwater Pumps.

3.1.21.1 Valves, Interlocks and Piping.

3.1.22 Radiation Monitor R-11, R-12, R-10A.

3.1.23 Pressurizer Safety Valves.

3.1.24 Main Steam Safety Valves (> 350°F).

3.1.25 Station Batteries.

3.1.26 Battery chargers (1 of 2 required).

3.1.27 D.C. Control System.

3.1.28 Control Rod Misalignment Monitors per Item 16, Table 3.5-1, Instrument Operation Conditions.

3.1.29 Circulating Water Flood Protection - Screenhouse Channel.

3.1.30 Circulating Water Flood Protection - Condenser Channel.

3.1.31 Shock Suppressor listed in T.S., Table 3.13.1, (all required operable).

3.1.32 Fire Suppression Water System (Refer to SC-3.15.17)

3.1.33 Fire Detection Instruments (Refer to SC-3.15.17)

3.1.34 Fire Spray Systems (Refer to SC-3.15.17)

3.1.35 Halon Systems (Refer to SC-3.15.17)

3.1.36 Overpressure Protection System

3.2 Equipment deemed inoperative. ____________________

TIME: ____________

DATE: ____________

Reason equipment deemed inoperative: ____________________

3.3 Operating Mode of Plant. (Check appropriate mode).

OPERATING: ______________________

HOT SHUTDOWN: ______________________

COLD SHUTDOWN: ______________________

PRECAUTION: If Plant Operating Mode is to be changed, it can only be changed in conservative direction when equipment is inoperative.

3.4 From Technical Specifications, Section 3, using the Operating Mode checked in Step 3.3, determine the time limits and action(s) required to maintain the Plant at present Operating Mode. If one containment recirculation fan is deemed inoperative, after 6 days, follow Technical Specifications as if TWO containment recirculation fans were deemed inoperative.

3.5 Period of time equipment allowed to be inoperative as determined from Step 3.4. If no limiting conditions apply, mark no limit.

Hours ________

Days ________

3.6 Action required if time limit in Step 3.5 cannot be met. (Check appropriate action). If no limit was indicated in Step 3.5, mark N/A below.

Place Plant in Hot Shutdown Mode (refer to 0-2.1). ________

Place Plant in Cold Shutdown Mode (refer to 0-2.2). ________

Evaluate need to notify NRC by telephone within one hour (Refer to 0-9.3). ________

Other (Refer to applicable Tech. Spec. Section):

____ ________

EQUIPMENT DEEMED INOPERATIVE BY: ______________________

DATE: ______________________

HEAD CONTROL OPERATOR: ______________________

3.6.1 At this time submit copies of A-52.4 to Operations Engineer and Maintenance Engineer prior to step 3.7. ________

SHIFT SUPERVISOR: ______________________

3.7 Time and date equipment deemed operable:

Time: ______________________

Date: ______________________

3.7.1 Procedure(s) used for maintenance (M, EM, SM, CP or PR only, may be used for maintenance).

Procedure(s) No. Title

____

____

NOTE: In accordance with Technical Specification 6.8, maintenance on safety related items must be done in accordance with approved procedure.

COMPLETED BY: ____________________

DATE COMPLETED: ____________________

HEAD CONTROL OPERATOR: ____________________

SHIFT SUPERVISOR: ____________________

NOTE: Forward to Plant Superintendent.

3.8 Technical Specification requirements 6.5.1f states:

"The PORC shall be responsible for review of facility operations to detect Potential Safety Hazards".

The Plant Superintendent shall present this procedure to the Plant Operations Review Committee to comply with this requirement. ______

P.O.R.C. MEETING NUMBER: ____________________

PLANT SUPERINTENDENT: ____________________

GINNA STATION
UNIT #1
COMPLETED
DATE :-
TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-52.5 REV. NO. 6

CONTROL OF LIMITING CONDITIONS FOR SYSTEM SPECIFICATIONS

TECHNICAL REVIEW

PORC 3/3/80

TRSchuler
QC REVIEW

3-5-80
DATE

APPROVED FOR USE

[signature]
PLANT SUPERINTENDENT

3-5-80
DATE

QA x NON-QA CATEGORY 1.0

REVIEWED BY:

THIS PROCEDURE CONTAINS 3 PAGES

A-52.5

CONTROL OF LIMITING CONDITIONS FOR SYSTEM SPECIFICATIONS

1.0 PURPOSE:

1.1 To establish a method of controlling the timer period for conditions/equipment not meeting the specifications for Limiting Conditions for Operations.

2.0 REFERENCES:

2.1 Technical Specifications

2.2 Procedure A-52.4, Control of Limiting Conditions for Operating Equipment.

2.3 0-9.3, NRC Immediate Notification

3.0 INSTRUCTIONS:

3.1 If any of the below condition/equipment is deemed out of specifications refer to Step 3.2.

3.1.1 Reactor Coolant Activity

3.1.2 Reactor Coolant Leakage

NOTE: Evaluate need to notify the NRC by telephone within one hour. See 0-9.3.

3.1.3 Reactor Coolant Oxygen, Chloride, Flouride

3.1.4 Boric Acid Storage Tanks

3.1.5 Accumulators

3.1.6 Refueling Water Storage Tank

3.1.7 Condensate Storage Tank

3.1.8 NaOH Tank

3.1.9 Containment Vessel Integrity

3.1.10 Reactor Quadrant to Average Tilt

3.1.11 Emergency Diesel Fuel

3.2 Condition deemed out of specification

Time: ____________

Date: ____________

Problem: ______________________________
____

3.3 Operating Mode of Plant. (Check appropriate mode).

OPERATING: ____________________

HOT SHUTDOWN: ________________

COLD SHUTDOWN: _______________

PRECAUTION: If Plant Operating Mode is to be changed, it can only be changed in conservative direction when equipment/ conditions out of specifications.

3.4 From Technical Specifications, Section 3, using the Operating Mode checked in step 3.3, determine the time limits and action(s) required to maintain the Plant at present Operating Mode.

3.5 Period of time equipment/conditions allowed to be out of specifications as determined from step 3.4. If no limiting conditions apply, mark no limit.

Hours ________

Days ________

3.6 Action required if time limit in step 3.5 cannot be met. (Check appropriate action). If no limit was indicated in step 3.5, mark N/A below.

Place Plant in Hot Shutdown Mode (refer to 0-2.1) ________

Place Plant in Cold Shutdown Mode (refer to 0-2.2) ________

Other (Refer to applicable Tech. Spec. Section):

______________________________ ________

CONDITIONS/EQUIPMENT DEEMED OUT OF SPECIFICATIONS BY: ____________

DATE: ____________

HEAD CONTROL OPERATOR: ____________

3.6.1 At this time submit copies of A-52.5 to Operations Engineer and Maintenance Engineer prior to step 3.7. ________

SHIFT SUPERVISOR: ____________

3.7 Time and date conditions/equipment deemed in specifications:

Time: ____________________

Date: ____________________

3.7.1 Corrective action taken, include procedures titles if applicable:

Procedure(s) No.	Title
______________	______________________________
______________	______________________________

NOTE: In accordance with Technical Specification 6.8, maintenance on safety related items must be done in accordance with approved procedure.

COMPLETED BY: ____________________

DATE COMPLETED: ____________________

HEAD CONTROL OPERATOR: ____________________

SHIFT SUPERVISOR: ____________________

NOTE: Forward to Plant Superintendent.

3.8 Technical Specification requirements 6.5.1f states:

"The PORC shall be responsible for review of facility operations to detect Potential Safety Hazards".

The Plant Superintendent shall present this procedure to the Plant Operations Review Committee to comply with this requirement.

PORC MEETING NUMBER: __________

PLANT SUPERINTENDENT: __________

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-53.0 REV. NO. 14

PREVENTIVE MAINTENANCE PROGRAM

TECHNICAL REVIEW

PORC 1-21-80

TRSchuler
QC REVIEW

1-28-80
DATE

APPROVED FOR USE

[signature]
PLANT SUPERINTENDENT

1-28-80
DATE

QA x NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 16 PAGES

A-53.0

PREVENTIVE MAINTENANCE PROGRAM

1.0 PURPOSE:

The purpose of this procedure is to outline the preventive maintenance program at Ginna Station. It includes the current years' inspection schedule.

2.0 REFERENCES:

2.1 American National Standard N 18-7-1972, Administrative Controls for Nuclear Power Plants.

2.2 Safety Guide 33, Quality Assurance Program Requirements (Operations)

2.3 Mobil Engineering Service Report, Lubrication Manual, Brookwood Station.

3.0 INSTRUCTIONS:

3.1 General Description:

The Preventive Maintenance Program provides a schedule for lubrication, maintenance inspection, and placement of equipment included in the program.

In addition to this maintenance inspection, the equipment is being monitored on a more frequent basis by operations personnel. In the event of equipment failure or possible malfunction, trouble cards are initiated as described in A-18, Multileaf Trouble Report and Work Order, and actions also may be taken as directed by A-25, Reporting of Unusual Plant Conditions. Oil levels, bearing temperatures, visual vibration, and operating noise levels are monitored by the operator on his routine rounds. Equipment performance is also monitored during its usage and noticeable degradations are reported. Performance of safety-related equipment is also monitored by the Results and Test Department during performance of the surveillance testing program. Administrative Procedure A-52.3, Starting and Stopping of Plant Equipment provides direction for close observation of equipment during starting and stopping.

3.2 Program Responsibilities and Review:

The Maintenance Shop Foremen are responsible for the operation of the program. The Maintenance Supervisor or his designee will check the schedule on a monthly basis to ensure it is being followed. The Shop Foreman will note any preventive maintenance performed during the previous week on their Major Work Accomplished Sheet.

A report will be submitted for any major inspection performed, to the Maintenance Engineer. Any significant deviation (greater than 25%) from the prescribed period of the program will require approval of the Maintenance Engineer, and a Ginna Station Change in Procedure Request Form shall be initiated for approval.

The overall program will be reviewed annually by the Maintenance Supervisor and Shop Foremen for content and updating to maintenance experiences. During the year changes may be made by use of the "Ginna Station Change in Procedure Request" Form.

Crane Inspection and Maintenance is performed by the General Maintenance Department under the guidelines of their Quality Control Program. Inspection and Maintenance Reports from them will be submitted to the Maintenance Engineer for use in equipment histories. The Maintenance Department will review these reports to determine if additional Work Orders or Engineering Work Requests are necessary to correct any deficiencies.

3.3 Preventive Maintenance Inspection Schedule:

Schedule Attached.

3.4 Equipment Inspection Period and Lubricant List, (A-53.1)

3.5 3 Month Lubrication Surveillance and Maintenance Records, (A-53.2)

4.0 RECORDS

4.1 None

A-53.0

Month - JANUARY 1980

INSP. INTVL. (MONTHS)	EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
3	Lub. - Maint. Insp.	1/80	10/79	
12	" C " Instr. Air Compressor	1/80	1/79	
24	" A " Waste Gas Compressor	1/81	1/79	
24	" B " Waste Gas Compressor	1/81	1/79	
24	" A " Boric Acid Evap. Feed Pump	1/81	1/79	
24	" B " Boric Acid Evap. Feed Pump	1/81	1/79	
36	" B " Boric Acid Evap. Distl. Pump	1/82	1/79	
12	R-10 A Rad. Sample Pump	1/80	1/79	
12	" A " Reactor Water Make-up Pump	1/80	12/77	
12	" B " Reactor Water Make-up Pump	1/80	12/77	

INSP. INTVL. (MONTHS)	Month - FEBRUARY 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
12	Breathing Air Compressor	2/80	1/79	
6	R-13/14 Rad. Sample Pump	2/80	8/79	
12	D-I Acid Pump	2/80	1/79	
12	Refueling W. Purif. Pump	2/80	1/79	
12	Waste Evap. Feed Tank Pump	2/80	5/78	

A-53.0:4

Month - MARCH 1980 A-53.0:5

INSP. INTVL. (MONTHS)	EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
24	" A-B " Phosphate Pump	3/81	3/79	
24	# 2 Phosphate Pump	3/81	3/79	
24	# 3 Phosphate Pump	3/81	3/79	
24	Hydrazine Pump	3/81	3/79	
24	" A " Water Box Vac. Priming Pump	3/81	3/79	
24	" B " Water Box Vac. Priming Pump	3/81	3/79	
24	Degasifier Vac. Pump	3/81	3/79	
36	" A " Diesel Gen. Prelube Pump	3/82	2/79	
60	" A " E. H. Control Oil Pump	3/84	3/79	
36	" P-11 " AVT Hot Water Supply Pump	3/82	3/79	
48	" A " Seal Diff. Booster Pump	3/83	3/79	
60	Turbine Oil Bowser Circ. Pump	3/84	3/79	
60	Turbine Air Seal Oil Pump	3/84	3/79	
60	Turbine D-C Air Seal Oil Pump	3/84	3/79	
60	Turbine Hydrogen Seal Oil Pump	3/84	3/79	
60	Turbine High Press. S. O. Back U. Pump	3/84	3/79	
60	" A-1 " M.F.W.P. Lube Oil Pump	3/84	3/79	
60	" A-2 " M.F.W.P. Lube. Oil Pump	3/84	3/79	
60	" A " M.F.W.P. D-C Lube. Oil Pump	3/84	3/79	
60	" B " M.F.W.P. D-C Lube. Oil Pump	3/84	3/79	
60	Aux. Stm. DR. F.W.P. D-C Lube. Oil Pump	3/84	3/79	
24	" B " House Heating Boiler Fd. Pump	3/81	3/79	
12	Morphaline Pump	3/80	3/79	
12	Safeguard Breaker (Multiamp Test)	3/80		
24	House Heating Boiler F.D. Fan	3/81	3/79	
12	" B " Degasifier Booster Pump	3/80	3/79	
12	D-I Caustic Pump	3/80	3/79	

Month - APRIL 1980 (SHUTDOWN)

INSP. INTVL. (MONTHS)	EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. A-53.0:6 DATE COMPL.
12	" A " Main Feed Water Pump (Major)	4/80	3/79	
12	" B " Main Feed Water Pump	4/80	3/79	
12	" A " Condensate Pump	4/80	5/79	
12	" B " Condensate Pump	4/80	3/79	
12	" C " Condensate Pump	4/80	3/79	
12	" A " Heater Drain Pump	4/80	3/79	
12	" B" Heater Drain Pump	4/80	3/79	
12	" A " Boric Acid Transfer Pump	4/80	3/79	
12	" B " Boric Acid Transfer Pump	4/80	3/79	
12	" A " Hotwell Sample Pump	4/80	3/79	
12	" B " Hotwell Sample Pump	4/80	3/79	
12	" A " Diesel Generator	4/80	3/79	
12	" B " Diesel Generator	4/80	3/79	
12	" A " Motor-Generator Set	4/80	3/79	
12	" B " Motor-Generator Set (Major)	4/80	3/79	
12	Fuel Transfer Equipment	4/80	2/79	
12	" A " Reactor Coolant Pump	4/80	3/79	
12	" B " Reactor Coolant Pump	4/80	3/79	
12	" A " Aux Feed Water Pump	4/80	3/79	
12	" B Aux. Feed Water Pump	4/80	3/79	
12	Steam Dr. Aux Feed W. Pump	4/80	3/79	
12	" A " Degasifier Booster Pump	4/80	3/79	
12	" A " Containment Spray Pump	4/80	3/79	
12	" B " Containment Spray Pump	4/80	3/79	
12	" A " Safety Injection Pump	4/80	3/79	
12	" B " Safety Injection Pump	4/80	3/79	
12	" C " Safety Injection Pump	4/80	3/79	

INSP. INTVL. (MONTHS)	Month - APRIL 1980 (SHUTDOWN) EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
12	Equipment Hatch	4/80	3/79	
12	Personnel Hatch	4/80	3/79	
12	" A " Charging Pump	4/80	3/79	
12	" B " Charging Pump	4/80	3/79	
12	" C " Charging Pump	4/80	3/79	
12	" A " R. H. R. Pump	4/80	3/79	
12	" B " R H. R. Pump	4/80	3/79	
12	" A " Component Cooling Pump	4/80	3/79	
12	" B " Component Cooling Pump	4/80	3/79	
12	" A " Condenser Circ. Pump	4/80	3/79	
12	" B " Condenser Circ. Pump	4/80	3/79	
12	" A " Generator Bus Isophase Fan	4/80	3/79	
12	" B " Generator Bus Isophase Fan	4/80	3/79	
12	Demineralizer Recirc. Pump	4/80	3/79	
12	" A " Diesel Gen. Start Compressor	4/80	3/79	
12	" B " Diesel Gen. Start Compressor	4/80	3/79	
12	"2-A " AVT Acid Pump	4/80	3/79	
12	"2-B " AVT Acid Pump	4/80	3/79	
12	"3-A " AVT Caustic Pump	4/80	3/79	
12	"3-B " AVT Caustic Pump	4/80	3/79	
12	"A-1 " AVT Blower	4/80	3/79	
12	"P-6 " AVT Ammonia Recycle Pump	4/80	3/79	
12	"P-5 " AVT Dilute Caustic Pump	4/80	3/79	
12	"P-4 " AVT Dilute Acid Pump	4/80	3/79	
12	"1-A " AVT Regen. W. Sluice Pump	4/80	3/79	
12	"1-B " AVT Regen. W. Sluice Pump	4/80	3/79	
12	"P-8 " AVT High Cond. Waste Trans. Pump	4/80	3/79	

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INSP. INTVL. (MONTHS)	Month - APRIL 1980 (SHUTDOWN) EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
12	" P-7 " AVT Low Cond. Waste Trans. Pump	4/80	3/79	
12	" A " Condensate Booster Pump	4/80	3/79	
12	" B " Condensate Booster Pump	4/80	3/79	
12	" C " Condensate Booster Pump	4/80	12/79	
12	" A " Seal Drain Pump (Motor)	4/80	12/79	
12	" B " Seal Drain Pump (Motor)	4/80	12/79	
60	Transformer Cooling Fans (Thirty)	4/84	4/79	
12	Neutralizing Tank Pump	4/80	4/79	
12	Containment Fans (Ten)	4/80	3/79	
3	Lube.- Maint. Insp. A-53.2	4/80	1/80	
6	R-11/12 Rad. Monitor	4/80	10/79	
12	R-10 B Radiation Monitor	4/80	4/79	
12	" A " Traveling Screen	4/80	4/79	
12	" B " Traveling Screen	4/80	4/79	
12	" C " Traveling Screen	4/80	4/79	
12	" D " Traveling Screen	4/80	4/79	
12	Spent Fuel Pit Recirc. Pump	4/80	2/79	
36	Fire Service Booster Pump	4/82	4/79	
60	" A " Control Access Area Exh. Fan	4/84	4/79	

Month - MAY 1980

INSP. INTVL. (MONTHS)	EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
12	" B " Inst. Air Compressor	5/80	5/79	
12	Electric Fire Pump	5/80	5/79	
60	" B " Control Access Area Exh. Fan	5/84	5/79	
12	Ultra Filtration Waste Circ. Pump	5/80	5/79	
12	Ultra Filtration Waste Feed Pump	5/80	5/79	
12	" A " Inst. Air Compressor	5/80	5/79	

INSP. INTVL. (MONTHS)	Month - JUNE 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP DATE COMPL.
12	" A " Reactor Coolant Drain Tank Pump	6/80	6/79	
24	" B " Reactor Coolant Drain Tank Pump	6/81	6/79	
12	" D " Service Water Pump	6/80	6/79	
12	" C " Aux. Feed Water Pump (Standby)	6/80	6/79	
12	" D " Aux. Feed Water Pump (Standby)	6/80	6/79	
12	House Heating Boiler	6/80	6/79	

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INSP. INTVL. (MONTHS)	Month - JULY 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. A-53.0:1 DATE COMPL.
3	Lube.-Maint. Insp. A-53.2	7/80	4/80	
12	" C " Service Water Pump	7/80	7/79	
12	Warehouse Boiler	7/80	7/79	
12	" A " Service Water Pump	7/80	7/79	

INSP. INTVL. (MONTHS)	MONTH - AUGUST 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
36	" A " Concentrates Holding Tank Trans, Pump	8/80	12/77	
36	" B " Concentrates Holding Tank Trans. Pump	8/82	8/79	
24	" B " Gas Stripper Feed Pump	8/81	8/79	
12	House Service Air Compressor	8/80	8/79	
12	Engine Driven Air Samplers	8/80	8/79	
6	R- 13/14 Rad.-Sample Pump	8/80	2/80	
24	Laundry And Hot Shower Supply Pump	8/81	8/79	
24	Laundry And Hot Shower Drain Tank Pump	8/81	8/79	
24	Chemical Drain Tank Pump	8/81	8/79	
12	Diesel Fire Pump	8/80	8/79	

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INSP. INTVL. (MONTHS)	Month - SEPTEMBER 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.
12	Hot Water Boiler (Serv. Bldg.)	9/80	9/79	
12	Air Handling Units (all)	9/80	9/79	
24	Retention Tank Discharge Pump	9/81	9/79	
24	" A " AVT Sump Pump	9/81	9/79	
24	" B " AVT Sump Pump	9/81	9/79	

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INSP. INTVL. (MONTHS)	Month - OCTOBER 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL. A-53.0:1
3	Lube.-Maint. Insp. A-53.2	10/80	7/80	
6	R-11/12 Radiation Sample Pump	10/80	4/80	
12	Canal Sample Pump	10/80	10/79	
12	Environmental Air Samplers (15)	10/80	10/79	

INSP. INTVL. (MONTHS)	Month - NOVEMBER 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL.	A-53.0:1
48	Reverse Osmossis Unit	11/80	11/76		
60	C. V. C. S . Recirc. Pump (Hold Up Tank)	11/80	3/74		
60	" A " Purge Exh. Fan	11/84	11/79		
48	Waste Evap. Hot Watef Circ. Pump	11/83	11/79		

INSP. INTVL. (MONTHS)	Month - DECEMBER 1980 EQUIPMENT	INSP. DUE DATE	LAST INSP. DATE	INSP. DATE COMPL. A-53.0:1
12	Torque Wrench Test Stand Calib.	12/80	12/79	
60	" B " E. H. Control Oil Pump	12/84	12/79	
6	Hose Reel Lubrication	6/80	12/79	
60	1-B-1 M.F.W.P. Lube Oil Pump	12/84	12/79	
60	1-B-2 M.F.W.P. Lube Oil Pump	12/84	12/79	
12	" B " Service Water Pump	12/80	1/80	

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-53.1 REV. NO. 7

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST

TECHNICAL REVIEW

PORC 9/17/79

TRSchuler 9-27-79
Q/C REVIEW DATE

APPROVED FOR USE

Bruce A Snow 9-28-79
PLANT SUPERINTENDENT DATE

QA X NON-QA ______ CATEGORY ______

LIFETIME ______ NONPERMANENT ______

REVIEWED BY ______ DATE ______

THIS PROCEDURE CONTAINS 53 PAGES

REC. CENTRAL RECORDS DATE ______

DISP. DATE ______

A-53.1

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST

1.0 PURPOSE:

1.1 This lists equipment included in the Ginna Station Preventive Maintenance Program. It references the desired inspection intervals for the equipment, associated maintenance procedures, and the proper lubricant for the equipment.

2.0 REFERENCES:

2.1 A-53.0, Preventive Maintenance Program.

2.2 Mobil Engineering Service Report, Lubricant Manual, Brookwood.

3.0 INSTRUCTIONS:

3.1 Use the attached list for a reference for equipment inspection procedures, lubricant, and inspection intervals.

4.0 RECORDS:

4.1 None

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST	PAGE
Residual Heat Pumps 1A & 1B	PM-1
Sump Tank Pumps 1A & 1B	PM-1
Sump Pumps 1A & 1B	PM-1
Reactor Coolant Drain Tank Pumps 1A & 1B	PM-1
Spent Fuel Pit Pump	PM-2
Refueling Water Purification Pump	PM-2
Hold Up Tank Recirc. Pump	PM-2
Gas Stripper Feed Pumps 1A & 1B	PM-2
Safety Injection Pumps 1A, 1B, & 1C	PM-4
Charging Pumps 1A, B, & C	PM-4
Waste Evaporator Feed Pump	PM-4
Condensate Return Pump #2	PM-5
Containment Spray Pumps 1A & 1B	PM-5
Charging Pump Leakoff Pumps	PM-5
Condensate Return Pump #1	PM-5
Concentrates Holding Tank Transfer Pumps 1A & 1B	PM-6
Waste Gas Compressor 1A & 1B	PM-6
Charcoal Filter Exhaust Fans 1A & 1B	PM-6
Boric Acid Batch Tank Pump	PM-6
Boric Acid Transfer Pumps 1A & 1B	PM-7
Penetration Cooling Fans 1A & 1B	PM-7
Aux. Bldg. Supply Fans 1A & 1B	PM-7
Bailing Machine	PM-7
Auxiliary Building Exhaust Fan 1-G	PM-7
Component Cooling Pumps 1A & 1B	PM-8
Waste Condensate Tank Pump 1A & 1B	PM-8
Reactor Makeup Pump 1A & 1B	PM-8
Monitor Tank Pump	PM-8

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST	PAGE
Turning Gear Drive	PM-11
Main Feed Water Pumps 1A & 1B	PM-11
Feed Water Pump Seal Drain Pumps	PM-11
Vacuum Priming Pumps 1A & 1B	PM-12
Condenser Pit Sump Pumps 1A & 1B West	PM-12
Condenser Pit Sump Pump East	PM-12
Seal Water Booster Pumps 1A & 1B	PM-12
Turbine Oil Circulation Pump (Bowser Unit)	PM-13
Condensate Pump A, B, & D	PM-13
Heater Drain Pumps 1A & 1B	PM-13
Service Air Compressor	PM-13
Instrument Air Compressor 1A, B, & C	PM-14
Fire Service Booster Pump	PM-14
Blowdown Transfer Pump	PM-14
Turbine Oil Tank Vapor 1A & 1B Extractor	PM-14
Hydrogen Drier Blower	PM-14
Hydrogen Seal Oil Pumps AC & DC	PM-15
Condensate Transfer Pump	PM-15
Condenser Hotwell Sample Pump 1A & 1B	PM-15
Relay Room Air Conditioning Units 1A & 1B	PM-15
Control Room Air Handling Unit Supply Fan	PM-17
Control Room Air Handling Unit Exhaust Fan	PM-17
Phosphate Pump (Main)	PM-17
Hydrazine Pump	PM-17
Morphaline Pump	PM-18
Gland Seal Condenser Vent Fan	PM-18
Generator Seal Oil Vapor Extractor Fan	PM-18

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST	PAGE
Phosphate Pump 1A & 1B (Metering)	PM-18
Turbine E - H Governor Oil Pumps	PM-18
Turbine Oil Transfer Pump	PM-19
Diesel Generator Air Start Compressors 1A & 1B	PM-19
Diesel Generator Fuel Oil Transfer Pumps 1A & 1B	PM-19
Diesel Generator Units 1A & 1B	PM-19
Spent Fuel Pit Skimmer Pump	PM-20
Chemical Drain Tank Pump	PM-20
Laundry & Hot Shower Tank Pump	PM-20
Auxiliary Feed Pumps 1A & 1B	PM-20
Auxiliary Feed Pumps Turbine Driven	PM-21
MG Generator Sets 1A & 1B	PM-21
Chilled Water Pumps 1A & 1B	PM-21
House Heating Boiler Feed Pumps 1A & 1B	PM-22
Condensate Return Pump	PM-22
Intermediate Building Sump Pump	PM-22
Containment Purge Supply Fans 1A & 1B	PM-22
Containment Purge Exhaust Fans 1A & 1B	PM-23
Auxiliary Building Main Exhaust Fans 1A & 1B	PM-23
Auxiliary Building Decon & Spent Fuel Pit Exhaust Fan 1-C	PM-23
Intermediate Building Exhaust Fans 1A & 1B	PM-23
Intermediate Building Supply Fan 1C	PM-25
Sewage Pumps 1A & 1B	PM-25
Degasifier Vacuum Pump	PM-25
Degasifier Booster Pumps 1A & 1B	PM-25
Anion Rinse Pump	PM-27
Condensate Return (Water Treatment Room)	PM-27
Radiator Hot Water Pump	PM-27

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST	PAGE
Laundry & Hot Sbower Supply Pump	PM-27
Sample Sink Collection Pump	PM-27
Caustic Pump	PM-28
Acid Pump	PM-28
Retention Tank Recirc. Pump	PM-28
Retention Tank Sample Pump	PM-28
Condenser Circ. Pumps 1A & 1B	PM-29
Fire Service Water Pump (Electric)	PM-29
Diesel Fire Service Water Pump	PM-29
Service Water Cooling Pumps 1A, B, C, D	PM-30
Traveling Screens 1A, B, C, D	PM-30
Chlorene Pump 1A & 1B	PM-31
Condensate Return Tank Pump (Boiler)	PM-31
Sump Pump	PM-31
Charging Pump Room Fans A & B	PM-3
Residual Heat Removal Pit Fans A & B	PM-3
Safety Injection Pump Fans A, B, & C	PM-3
Boric Acid Evaporator Distillate Pump	PM-3
Boric Acid Evaporator Feed Tank Pump	PM-3
Control Access Fans A & B	PM-24
Service Building Air Handling Units A, B, C, D, & E	PM-26
Neutralizing Tank Release Pump	PM-26
Laundry Hot Water Tank Recirculation Pump	PM-26
Condensate Return Pump on Caustic Heat Exchanger	PM-26
Heating Boiler, Hot Water Circulation Pumps (Warehouse)	PM-28
Canal Sample Pump	PM-30
Spent Fuel Pit Bridge & Hoist	PM-32
Aux. Building Main Crane	PM-32
Drumming Station Bridge & Hoist	PM-34

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST	PAGE
Pressurizer Jib Crane	PM-37
Post Accident Air Handling Valves	PM-37
Containment Recirculating Fans A, B, C & D	PM-37
Control Rod Drive Shroud Fans A & B	PM-37
Reactor Coolant Pumps A & B	PM-38
Containment Sump Pumps	PM-38
Reactor Compartment Cooling Fans A & B	PM-38
Reactor Head Hoists (3)	PM-38
Containment Charcoal Filter Fans A & B	PM-39
Generator Bus Fans A & B	PM-16
Control Room Charcoal Recirculating Fan	PM-16
Condensate Return Pump (Jennings)	PM-16
Hot Water Boiler Recirculating Pumps	PM-26
Turbine Building Crane	PM-9
Containment Crane	PM-35
Chain Falls & Lugalls	PM-39
Fork Lift	PM-39
Standby Auxiliary Feedwater Pumps C & D	PM-39
AVT Condensate Booster Pumps A, B & C	PM-39
R-13/14 Radiation Sample Pump	PM-40
R-11/12 Radiation Sample Pump	PM-40
R-10A & B Radiation Sample Pump	PM-40
AVP-2A & B Acid Pump	PM-41
AVP-3A & B Caustic Pump	PM-41
AVA-1 Air Blower	PM-41
AVP-4 Dilute Acid Pump	PM-42
AVP-5 Dilute Caustic Pump	PM-42

EQUIPMENT INSPECTION PERIOD AND LUBRICANT LIST	PAGE
AVH-10 Sample Sink Chiller Pump	PM-42
AVP-1A & B Sluice Pump	PM-42
AVP-7 Waste Transfer Pump (Low)	PM-43
AVP-8 Waste Transfer Pump (High)	PM-43
AVP-10A & B Sump Pump	PM-43
AVP-6 Ammonia Recycle Pump	PM-44
AVP-11 Hot Water Supply Pump	PM-44

EQUIPMENT	LUBRICANT	BLDG./ / FLOOR	3 MONTH SURVEILLANCE *·PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
1A & 1B RESIDUAL HEAT REMOVAL PUMPS-PACIFIC PUMPS				M-11.15	Bi-Yearly Yearly	Minor Lubrication
Pump Bearings	Mobil DTE Oil 26	Aux./Sump	3M 40			
Motor	Sealed			M-45.1B		
Coupling	Mobilux EP No. 1					
1A & 1B SUMP TANK(GOULDS)				M-11.13	Yearly Bi-Yearly	Lubrication Minor
Pump Bearings	Mobil DTE Oil 26	Aux./Sump	3M 40			
Motor	Sealed			M-45.2		
Coupling	Dry					
1A & 1B SUMP PUMPS				M-11.17	Yearly Bi-Yearly	Lubrication Minor
(WEINMAN)						
Pump Bearings	Mobilux EP No. 1	Aux./Sump	3M 41			
Motor Bearings	Mobilux EP No.2			Motor M-45.2		
Coupling	Dry					
1A & 1B REACTOR COOLANT				M 11.11	1A - Yearly 1B-Biyearly	Major
DRAIN TANK PUMPS	Canned Pump	Aux./Sump				
(CHEMPUMP)						

* Refer to ... .. Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
SPENT FUEL PIT PUMP (INGERSOLL RAND)				M-11.14	Yearly	Minor
Pump Bearings	Mobil DTE Oil 26	Aux./Basement	3M 40			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
REFUELING WATER PURIFICATION PUMP (GOULD)				M-11.13	Yearly	Minor
Pump Bearings	Mobil DTE Oil 26	Aux./Basement	3M 40			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
HOLDUP TANK RECIRCULATION PUMP (INGERSOLL RAND)				M-11.14	5 Years	Minor
Pump Bearings	Mobil DTE Oil 26	Aux./Basement	3M 40			
Motor Bearings	Mobilux EP No.2					
Coupling	Dry					
1A & 1B GAS STRIPPER FEED PUMPS (CHEM.)				M-11.11	Bi-Yearly	Major
Motor	Canned Pump	Aux./Basement				
Pump						

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
CHARGING PUMP ROOM FANS				N/A	N/A	
Motor	EP No. 2	Aux./ Basement	3M 38			
Fan	EP No. 2					
RESIDUAL HEAT REMOVAL PIT FANS				N/A	N/A	
Motor	EP No. 2	Aux./ Basement	3M 38			
Fan	EP No. 2					
SAFETY INJECTION PUMP FANS				N/A	N/A	
Motor	EP No. 2	Aux/ Basement	3M 38			
Fan	EP No. 2					
Boric Acid Evaporator Feed Tank Pump (1A & 1B)	Canned Pump	Aux/Basement	-----	M-11.11	Biyearly	Major
Boric Acid Evaporator Distillate Pumps (1A &1B)	Canned Pump	Aux/Basement	-----	M-11.11	Tri-Yearly	Major
Waste Evaporator Feed Tk Pp.	Canned Pump	Aux/Basement	------	M-11.11	Yearly.	Major
Waste Evaporator Dist. Pump	Canned Pump	Aux/Basement	------	M-11.11	Yearly	Major

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
1A, 1B, & 1C SAFETY INJECTION PUMPS (WORTHINGTON)					Yearly	Lubrication Minor
Pump Bearings	DTE-26	Aux./Basement	3M 40			
Motor Bearings	EP-2					
Coupling	Dry					
1A, 1B, 1C CHARGING PUMPS (AJAX T-125)				M-11.4	1A/1B Yrly. 1C Yrly.	Minor
Crosshead Guides & Pin Bearings, Main Roller Bearings on Pump	Mobil Pagasus #360	Aux./Basement	3M 39			
Alten Speed Reducer	Mobil DTE Oil BB		3M 48			
U.S. Varidrive	Mobilux EP No. 2					
Motor	Mobilux EP No. 2					
WASTE EVAPORATOR FEED PUMP (GOULDS)				M-11.3	Yearly	Lubrication Minor
Pump Bearings	Mobil DTE Oil 26	Aux./Basement	3M 40			
Motor Bearings	Mobilux EP 2					
Coupling	Dry					

* Refer to : Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Periods	
NO. 2 CONDENSATE RETURN PUMP (JENNINGS)				N/A	Yearly	Lubrication Minor
Motor	Sealed	Aux/Basement	3M 43			
Pump	Self Lubricated					
1A & 1B CONTAINMENT SPRAY PUMPS (INGERSOLL RAND)				M-11.14	Yearly Bi-Yearly	Lubrication Minor
Pump Bearings	Mobil DTE Oil 26	Aux/Basement	3M 40			
Motor Bearings	Mobilux EP No.2					
Coupling	Dry					
CHARGING PUMP LEAK OFF RETURN (1A & 1B)					Tri-Yearly	Major
Pump	Lapp Pulsalube	Aux/Basement	3M 39	M-11.22		
Motor	Mobilux EP 2					
NO.1 CONDENSTAE RETURN PUMP (JENNINGS)				N/A	Yearly	Minor
Pump	Self Lubricated	Aux/Inter.Fl.	3M 43			
Motor	Sealed					
Waste Evaporator Hot Water Pump		Aux/Basement			Yearly	Minor

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
1A & 1B CONCENTRATES HOLDING TANKS TRANSFER PUMP (CHEM.)				M-11.11	Bi-Yearly	Major
Pump	Canned Pump	Aux/Inter. Fl.				
Motor						
WASTE GAS COMPRESSOR PACKAGE (NASH HYTOR)				M-36.1 M-36.2	Bi-Yearly	Minor
Pump Bearing	Mobilux EP No.1	Aux/Inter. Fl.	3M 41			
Motor Bearing	Mobilux EP No. 2					
Coupling	Dry					
CHARCOAL FILTER EXHAUST FANS (1A & 1B)				N/A	N/A	
Motor Bearings	Mobilux EP No. 2	Aux/Inter. Fl	3M 38			
Fan Bearings	Mobilux EP No. 1					
BORIC ACID BATCH TANK PUMP (CHEM.)				M-11.11	Tri-Yearly	Major
Motor	Canned Pump	Aux/Inter. Fl				
Pump						

* Refer to .... Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
1A & 1B BORIC ACID TRANSFER PUMPS (CHEM.)				M-11 M-11.11	Yearly	Major
Motor	Canned Pump	Aux/Oper. Fl.				
Pump						
PENETRATION COOLING(A&B) BLOWER (BUFFALO FORGE)				N/A	Yearly	Minor
Motor Bearings	Mobilux EP No. 2	Aux/Oper. Fl.	3M 37			
AUX. BLDG. SUPPLY FANS 1A & 1B (BUFFALO FORGE)				N/A	N/A	
Motor Bearings	Mobilux EP No. 2	Aux/Oper. Fl.	3M 38			
Fan Bearings	Mobilux EP No.1					
BAILING MACHINE				N/A	----	
Pump	Mobil DTE 25	Aux/Oper. Fl.	3M 39			
Motor	Sealed					
1G AUXILIARY BUILDING EXHAUST FAN				N/A	Yearly	
Fan & Linkage	Mobilux EP 1	Aux/Oper. Fl.	3M 37			
Motor	Mobilux EP 2					

* Refer to . Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
1A & 1B COMPONENT COOLING PUMPS (INGERSOLL RAND)				M-11.14	Yearly Bi-Yearly	Lubrication Minor
Pump Bearings	Mobilux EP No. 1	Aux/Oper. Fl.	3M 41			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
1A & 1B WASTE CONDENSATE TANK PUMPS (GOULDS)				M-11.13	Yearly Bi-Yearly	Lubrication Minor
Pump Bearings	Mobil DTE Oil 26	Aux/ Oper. Fl.	3M 40			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
1A & 1B REACTOR MAKEUP WATER PUMP (GOULDS)				M-11.13	Yearly Bi-Yearly	Lubrication Minor
Pump Bearings	Mobil DTE Oil 26	Aux/Oper. Fl.	3M 40			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
MONITOR TANK PUMP (GOULDS)				M-11.13	Yearly Bi-Yearly	Lubrication Minor
Pump Bearings	Mobil DTE Oil 26	Aux/Oper. Fl.	3M 40			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					

* Refer to . Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Check Insp. Monthly	Yearly
EQUIP NO. #1 WHITING CRANE HYDRAULIC						
Bridge Brake	Mobilux EP No. 1	Turb/Mezz	N/A	MHE-100-3	As Required	
Pillow Block	" " " "					
Sheave Pin	" " " "					
Thrust Bearing	" " " "					
BRIDGE						
Wheel Bearing	Mobilux EP No. 1					
Sheave Nest	" " " "					
DRUM						
Shaft Bearings	Mobilux EP No. 1					
TROLLEY						
Wheel Bearings	Mobilux EP No. 1					
BRIDGE						
Drive Gear Case	Mobil DTE Oil Ex Hvy					
Hoist Unit	" " " " "					
TROLLEY						
Drive Gear Case	Mobil DTE Oil Ex Hvy					

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER		
TURBINE CRANE (CON't).		Turb/Mezz				
HOIST						
Motor Brake	Mobil DTE Oil Ex Hvy					
Wire Rope	Mobiltac MM					
Open Drum Gear	Mobiltac MM					
Trolley Motor Brgs.	Mobilux EP. No. 1					
Bridge Motor Brgs.	Mobilux EP No. 1					
Hoist Motor Brgs.	Mobilux EP No. 1					

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
TURNING GEAR DRIVE				N/A	Yearly	
Motor	Mobil DTE 25	Turb/Oper. Fl.	3M 42			
1A & 1B FEEDWATER PUMPS (WORTHINGTON)				M-11.24	Yearly	Major
Pump & Westinghouse Gear Drive	Mobil DTE Oil 25	Turb/Basement	3M 42-44	M-11.25		
Motor	Mobil DTE Oil 25					
Auxiliary Oil Pumps						
AC & DC	Self Lubricated			M-11.23		
Auxiliary Oil Pump Motors	Mobilux EP No. 2					
Flex Coupling (Waldron)	Mobilux EP No. 0					
1A & 1B FEEDWATER SEAL WATER PUMPS (WEINMAN)				M-11.17	Bi-Yearly	Minor
Pump Bearings	Mobilux EP No. 2	Turb/Basement	3M 41			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					

*Refer to : Lubrication Instruction Code PM-11

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
1A & 1B VACUUM PRIMING PUMPS (NASH HYTOR)				N/A	Bi-Yearly	Major
Pump Bearings	Mobilux EP No. 1	Turb/Basement	3M 41-42			
Motor Bearings	Mobil DTE Oil 25					
Coupling	Dry					
CONDENSER PIT SUMP PUMP WEST (WEINMAN)				N/A	-----	
Pump Bearings	Mobilux EP No. 1	Turb/Basement	3M 41			
Motor Bearings	Sealed					
Coupling	Dry					
CONDENSER PIT SUMP PUMP EAST (WEINMAN)				N/A	Bi-Yearly	
Pump Bearings	Mobilux EP No. 1	Turb/Basement	3M 41			
Motor Bearings	Sealed					
Coupling	Dry					
SEAL WATER BOOSTER PUMPS (INGERSOL RAND)				M-11.14	Yearly	Major
Motor Bearings	Mobilux EP No. 2	Turb/Basement	3M 43			

* Refer to Lubrication Instruction Code PM-12

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection period	
TURBINE OIL CIRCULATION PUMP (BOWSER UNIT)				S/D	Yearly	
Motor Bearings	Mobilux . EP No. 2	Turb/Basement	3M 46			
Pump Bearings	Self Lubricated					
1A, 1B & 1C CONDENSATE PUMPS (BYRON JACKSON)				N/A	Yearly	Minor
Pump Bearings	Self Lubricated	Turb/Basement	3M 42			
Motor Bearings	Mobil DTE Oil 26					
Coupling	Dry					
1A & 1B HEATER DRAIN PUMPS (BYRON JACKSON)				M-11.26	Yearly	Minor
Pump Bearings	Self Lubricated	Turb/Basement	3M 42			
Motor Bearings	Mobil DTE Oil BB					
Coupling	Dry					
(JOY) SERVICE AIR COMPRESSOR				M-11.21	Yearly	Major
Cylinder Lubricator	Mobil DTE Oil 103	Turb/Basement	3M 40-45			
Bearings - Crankcase	Mobil DTE Ex. Hvy.					
Motor	Mobilux EP No. 2					

* Refer to . Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
1A, 1B & 1C INSTRUMENT AIR COMPRESSORS (JOY)					Yearly	Major
Bearings - Crankcase	Mobil DTE Ex. Hvy.	Turb/Basement	3M 40-45			
Motor	Mobilux EP No. 2					
FIRE SERVICE BOOSTER PUMP GOULDS				M-11.13	Yearly 3 Years	Lubrication Minor
Pump Bearings	Mobilux EP No. 1	Turb/Basement	3M 41			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
BLOWDOWN TRANSFER PUMP (PEERLESS)					3 Years	Minor
Pump Bearings	Mobilux EP No. 1	Turb/Basement	3M 41			
Coupling	Dry					
Motor	Mobilux EP No. 2					
TURBINE.OIL TANK VAPOR EXTRACTOR A & B				N/A	Bi-Yearly	
Motor	Sealed	Turb/Inter. Fl.	3M 37			
HYDROGEN DRIER BLOWER				N/A	Yearly	
Motor	Sealed	Turb/Basement	3M 37			

* Refer to Lubrication Instruction Code PM-14

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period	
AC & DC HYDROGEN SEAL OIL PUMPS				S/D	Yearly	Minor
Motor	Sealed	Turb/Basement	3M 43			
CONDENSATE TRANSFER PUMP (BUFFALO FORGE)				M-11.18	Yearly	Minor
Pump Bearings	Mobilux EP No. 1	Turb/Basement	3M 41			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
1A & 1B CONDENSER HOT WELL SAMPLE PUMP				M-11.11	Yearly	Major
Chem Pump	Canned	Turb/Basement				
[illegible] ROOM AIR CONDITION- [illegible] A & B				N/A	Yearly	
[illegible]	Mobil Delvac 1230	Turb/Inter.Fl.	3M 38			
Motor	Mobil EP2					

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period
Generator Buss Fans A & B				S/D	Yearly
Motor	Sealed	Turb./Bsmt.	3M 38		
Fan	EP No. 2				
Control Room Charcoal Recirculating Fan				S/D	Yearly
Motor	Sealed	Turb./Bsmt.	3M 38		
Fan	EP No. 2				
Condensate Return Pump (Jennings)				S/D	Yearly
Motor	Sealed	Turb./Bsmt.	3M 43		
Pump	Self Lubricated				

* Refer to ... Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
CONTROL ROOM AIR HANDLING UNIT SUPPLY FAN				S/D	Yearly	
Fan	Mobilux EP No. 2	Turb/Basement	3M 38			
Motor	Mobilux EP No.2					
CONTROL ROOM AIR HANDLINC UNIT EXHASUT FAN						
Fan	Mobilux EP No. 2	Turb/Basement	3M 38	S/D	Yearly	
Motor	Mobilux EP No. 2					
PHOSPHATE PUMP (MILROYAL)				----	----	
Pump Packing	Nord 147	Turb/Inter. Fl	3M 39			
Gears	Milroyal gear lube or Mobil Compound DD					
Motor Bearings	Sealed					
HYDRAZINE (MILROYAL)				S/D	Yearly	
Gears	Milroyal Gear Lube or Mobil Compound DD	Turb/Inter.Fl.	3M 39			
Diaphragm	Milroyal Gear Lube or Mobil Compound DD					
Motor Bearings	Sealed					

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period	
MORPHALINE PUMP (MILROYAL				-----	-----	
Gears	Milroyal Gear Lube or Mobil Compound DD	Turb/Inter.Fl	3M 39			
Diaphragm	Same Oil as Gears					
Motor Bearings	Sealed					
GLAND SEAL CONDENSER VENT FAN				S/D	Yearly	
Motor	Mobilux EP No. 2	Turb/Inter.Fl	3M 37			
Shaft Seal	EP-1					
GENERATOR SEAL OIL VAPOR EXTRACTOR FAN				S/D	Bi-Yearly	
Motor	Mobilux EP No. 2	Turb/Inter.Fl	3M 37			
PHOSPHATE PUMPS (1A & 1B)				S/D	Yearly	
Gears	Milroyal Gear Lube or Mobil Compound DD	Turb/Inter.Fl	3M 39			
Motor Bearings	Mobilux EP No. 2					
Diaphragm	Same Oil as Gears					
TURBINE E-H GOVERNOR OIL PUMPS 1A & 1B		Turb/Inter.Fl		S/D	Bi-Yearly	
Motor Bearings	Sealed		3M - 43			
Pump Bearings	Self Lubricated					

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
TURBINE OIL TRANSFER PUMP (ROPER)				N/A	3 Years	
Motor	Sealed	Turb/Oil Room	3M 46			
Pump Bearings	Self Lubricated					
Gear Box	Mobil DTE BB					
1A & 1B DIESEL GENERATOR STARTUP AIR COMPRESSOR				M 15-4	Yearly	
Crankcase	Mobil DTE Extra Heavy	Diesel Generator Rm	3M 40			
Motor	EP-2					
1A & 1B DIESEL GENERATOR FUEL TRANSFER PUMP(DELAVAL)				M 15.3	Bi-Yearly	
Pump Bearings	Self Lubricated	Diesel Generator Rm	3M 46			
Motor	EP-2					
1A & 1B DIESEL GENERATOR UNITS(ALCO)MODEL 16-251F				M-15 M-15.1	Yearly	
Crankcase	Mobil Delvac 1240	Diesel Generator Rm	3M 47			
Air Starter Motor	Mobilux EP No. 1					
Norgren Micro Fog	Mobil DTE Oil 24					
Woodward Governor	Mobil DTE Oil 26					
Generator Main Bearings	Non Fluid Grease S-58					
Prelube Pump	Self Lubricating		3M-46	M-11.23	Tri-Yearly	
Prelube Pump Motor	Sealed					

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
SPENT FUEL PIT SKIMMER PUMP (DURCO)				M-11.16	Yearly	Minor
Pump Bearings	Mobil DTE Oil 26	Inter/Basement	3M 40			
Motor Bearings	Mobilux EP No. 2					
Flexible Coupling	Dry					
CHEMICAL DRAIN TANK PUMP (GOULDS)				M-11.13	Yearly	Minor
Pump Bearings	Mobil DTE Oil 26	Inter/Basement	3M 40			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
LAUNDRY & HOT SHOWER TANK PUMP (GOULDS)				M-11.13	Yearly	Minor
Pump Bearings	Mobil DTE Oil 26	Inter/Basement	3M 40			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
1A & 1B AUXILIARY FEED WATER PUMPS (WORTHINGTON)				M-11.5 Series	Yearly	Minor
Pump Bearings	Mobil DTE Oil 26	Inter/Basement	3M 40-42-44			
Motor	Mobil DTE Oil 25					
Falk Gear Increaser	Mobil DTE Oil BB					

* Refer to ... Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ / FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
1A & 1B AUXILIARY FEED WATER PUMPS (CON'T)						
Falk Gear Increaser Lube Pump	Self Lubricating					
Motor Bearings (Lube Pump)	Mobilux EP No. 2					
Falk Coupling	Mobilux EP No. 1					
AUXILIARY TURBINE DRIVEN FEED PUMP (WORTHINGTON)					Yearly	Minor
Pump Bearings	Mobil Oil DTE 26	Inter/Basement	3M 40-44			
Turbine Bearings	Mobil DTE-797					
Auxiliary Lube Oil Pumps	Self Lubricated					
Auxiliary Lube Oil Pump Motors AC & DC	Mobilux EP No. 2					
1A & 1B MG GENERATOR SETS				M-45.1A	Yearly	Minor
Motor Bearings	Mobilux EP No. 2	Inter/Basement	3M 45			
Generator Bearings	Mobilux EP No. 1					
1A & 1B CHILLED WATER PUMPS (GOULDS)				M-11.13	Bi-Yearly	Minor
Motor	Mobilux EP No. 2	Inter/Basement	3M 43			

* Refer to Lubrication Instruction Code PM-21

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
1A & 1B HOUSE HEATING BOILER FEED PUMPS (GOULDS				M-11.13	Bi-Yearly	
Motor	Mobilux EP No. 2	Inter/Basement	3M 41			
Pump	Mobilux EP No. 1					
Coupling	Dry					
CONDENSATE RETURN PUMP				N/A	Yearly	
Motor	Sealed	Inter/Basement	3M 43			
Pump	Self Lubricating					
INTERMEDIATE BUILDING SUMP PUMP (WEINMAN)				N/A		
Pump Bearings	Mobilux EP No. 1	Inter/~~[illegible]~~. Bsmt.	3M 41		----	
Motor Bearings	Sealed					
Coupling	Dry					
CONTAINMENT PURGE SUPPLY FANS (1A & 1B)					Yearly	
Motor Bearings	Sealed	Inter/2nd Fl.	3M 38			
Fan Bearings	Mobilux EP No. 2					

* Refer to . . Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period	
CONTAINMENT PURGE EXHAUST FANS				N/A	Yearly	
Motor Bearings	Sealed	Inter/2nd Fl.	3M 38			
Fan Bearings	Mobilux No. 2					
AUXILIARY BUILDING DECON & SPENT FUEL PIT EXHAUST FAN				N/A	N/A	
Fan Bearings	Mobilux EP No. 2	Inter/2nd Fl.	3M 38			
Motor Bearings	Sealed					
AUXILIARY BUILDING MAIN EXHAUST FANS 1A & 1B				N/A	Bi-Yearly	
Motor Bearings	Mobil.Oil DTE 25	Inter/2nd Fl.	3M 37-42			
Fan Bearings	Mobilux EP No. 2					
INTERMEDIATE BUILDING EXHAUST FANS (1A & 1B)				N/A	N/A	
Motor Bearings	Sealed	Inter/2nd Fl.	3M 38			
Fan Bearings	Mobilux EP No. 2					

* Refer to Lubrication Instruction Code PM-23

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
CONTROL ACCESS FANS A, B				N/A	Yearly	
Motor Bearings	Sealed	Inter/Basement	3M 38			
Fan Bearings	EP No. 2					

* Refer to " Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period	
1C INTERMEDIATE BUILDING SUPPLY FAN				N/A	N/A	
Motor Bearings	Sealed	Inter/Basement	3M 38			
Fan Bearings	Mobilux EP No. 2					
SEWAGE PUMP (ECONOMY) 1A&1C				N/A	-----	
Motor	Mobilux EP No. 2	Service/Bsmt	3M 41			
Pump	Mobilux EP No. 1					
1A DEGASIFIER VACUUM PUMP (NASH HYTOR)				N/A	Bi-Yearly	
Pump Bearings	Mobilux EP No. 1	Service/1st Fl	3M 41			
Motor Bearings	Mobilux EP No. 2					
1A & 1B DEGASIFIER BOOSTER PUMP (BUFFALO FORCE)				M-11.18	Yearly	
Pump Bearings	Mobilux EP No. 1	Service/Water Treatment Rm.	3M 41			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					

* Refer to . . . Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ / FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period
SERVICE BUILDING AIR HANDLING UNITS A,B,C,D,E				N/A	N/A
Motor	EP No. 2	Service/1st Fl	3M 38		
Fan	EP No. 2				
NEUTRALIZING TANK RELEASE PUMP					Yearly
PUMP	Mobile DTE - 26	Service/Water Treatment Rm.	3M 40	M-11.13	
LAUNDRY HOT WATER TANK RECIRCULATION PUMP					Yearly
Motor	Delvac 1230	Service/Water Treatment Rm.	3M 42		
CONDENSATE RETURN PUMP ON CAUSTIC HEAT EXCHANGER				N/A	Yearly
Motor	Sealed	Service/ Water Treatment Rm.	3M 42		
Hot Water Boiler Recirculating Pumps		Service/Hot Water Boil.Rm.	3M 43	N/A	Yearly
Motor/Pump	Delvac 1230				

* Refer to . Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
1A ANION RINSE WATER CIRCULATING PUMP (Buffalo Forge)				M-11.18	Yearly	
Pump Bearings	Mobilux EP No. 1	Service/Water Treatment Rm	3M 41			
Motor Bearings	Mobilux EP No. 2					
Coupling	Dry					
CONDENSATE RETURN				N/A	Yearly	
Motor	Sealed	Service/Water Treatment Rm	3M 43			
Pump	Self Lubricated					
RADIATOR HOT WATER PUMP					Tri-Yearly	
Pump Bearings	Mobilux EP No. 2	Service/Water Treatment Rm	3M 41			
Motor Bearings	Mobilux EP No. 2					
LAUNDRY & HOT SHOWER SUPPLY PUMP (Crane-Deming)				M-11.19	Yearly	
Pump Bearings	Mobilux EP No. 2	Service/Water Treatment Rm	3M 41			
Motor Bearings	Mobilux EP No. 2					
SAMPLE SINK COLLECTION PUMP						
Motor Bearings	Sealed	Service/Water Treatment Rm	3M 43			

* Refer to .. Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
CAUSTIC PUMP (LAPP)					Yearly	
Pump Gear & Hydraulic	Lapp Pulsa Lube #1	Service/Water Treatment Rm	3M 39	M-11.22		
Motor Bearings	Mobilux EP No. 2					
ACID PUMP (LAPP)					Yearly	
Pump Gear & Hydraulic	Lapp Pulsa Lube #1	Service/Water Treatment Rm	3M 39	M-11.22		
Motor Bearings	Mobilux EP No. 2					
RETENTION TANK RECIRCULATION PUMP (Gould)					Yearly	
Motor Bearings	Mobilux EP No. 2	Outside/Underground Vault	3M 41			
Pump Bearings	Mobilux EP No. 2					
RETENTION TANK SAMPLE PUMP (Crane-Deming)			M-11.19		Yearly	
Motor Bearings	Sealed	Outside/Underground Vault	3M 43			
HEATING BOILER HOT WATER CIRCULATION PUMPS						
Motor	Mobil Delvac 1230	Warehouse Boiler Room	3M 43			

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection Period	
1A & 1B CONDENSER CIRC-ULATING WATER PUMPS				S/D	Yearly	
(HYDE WINDLESS)						
Motor Bearings	Mobil Oil DTE 24	Screenhouse/ Top Floor	3M 42	M-45.2		
Pump	Water Lubricated			M-11.36		
Coupling	Dry					
FIRE SERVICE WATER PUMP (PEERLESS)(ELECTRIC)					Yearly	Minor
Motor Lower Bearings	Mobilux EP No. 2	Screenhouse/ Top Floor	3M 42-45	M-45.1A		
Motor Upper Bearings.	Mobil Oil DTE Ex Hvy					
Pump	Water Lubrieated			M-11.30.1		
DIESEL FIRE SERVICE WATER PUMP(PEERLESS)					Yearly	Minor
Cummins Engine				M-11.38.1		
Crankcase	Mobil Delvac 1230	Screenhouse/ Top Floor	3M 39-47			
Couplings	Mobilux EP No. 1					
Amarillo Drive Bearings	Mobil Oil DTE Ex Hvy					
Watson Spicer Joints	Mobilux EP No. 1					
Pump	Water Lubricated			M-11.30.1		

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	Inspection period	
1A & 1B, 1C & 1D SERVICE COOLING WATER PUMP (WORTHINGTON)				M-11.10	Yearly	Minor
Motor Upper Bearing	Mobil DTE Oil 26	Screenhouse/ Top Floor	3M 45-42	M-45.1A		
Motor Lower Bearing	Mobilux EP No. 2					
Stuffing Box	Mobilux EP No. 2					
Pump	Water Lubricated					
1A,1B,1C, & 1D TRAVELING SCREENS(LINK BELT)					Yearly	Minor
Reduction Gear	Mobil Oil DTE 26	Screenhouse/ Top Floor	3M 48			
Torque Converter Coupling	Mobil Oil DTE 24					
Motor	Mobilux EP No. 2					
Drive Chain	Mobil Tac E					
Basket Chain	Mobilux EP No. 2					
CANAL SAMPLE PUMP					Tri-Yearly	
Motor Bearings	Sealed	Screenhouse/ Basement	3M 43			

* Refer to . Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ / FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
1A & 1B CHLORINE PUMPS (LAPP)					Bi-Yearly	
Pump Gear & Hydraulic	Lapp Pulsa Lube #1	Screenhouse/ Basement	3M 39	M-11.22		
Motor Bearings	Mobilux EP No. 2					
CONDENSATE RETURN TANK (INGERSOLL RAND) BOILER				M-11.14	Bi-Yearly	
Pump Bearings	Self Lubricated	Screenhouse/ Basement	3M 43			
Motor	Mobilux EP No. 2					
SUMP PUMP						
Pump (Submersible)	Mobilux EP No. 1	Screenhouse/ Basement	3M41			
Motor (Submersible)	Mobilux EP No. 1					

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	CHECK	INSP.
EQUIP. NO. #2 SPENT FUEL BRIDGE & HOIST (P&H)		Aux/Op	N/A	MHE-500-2	As Required	
Electric Motors	Mobilux EP No. 1					
Shaft Bearings	Mobilux EP No. 1					
Hoist Tackle Sheaves	Mobilux EP No. 1					
Wire Rope	No Lubricant on Cable					
Open Gears	Mobiltac E					
Trolley Gear Case	Mobil DTE Oil Ex Hvy					
Bridge Drive Gear Case	Mobil DTE Oil Ex Hvy					
EQUIP. NO. #3 DRESSER CRANE & HOIST (AUX. BLDG.)		Aux/Op	N/A	MHE-100-1	As Required	
Gear Case	Mobil DTE Oil BB					
Open Gears	Mobiltac E					
Worm Gears	Mobil Compound DD					
GEAR CASES LABLED USE AFT						
AFT	Mobilfluid ATF 350					
Mechanical Load Brakes	Mobil DTE Oil 26					
Hydraulic Brakes	Mobil Super Hvy Duty Brake Cables					
Hoisting Cables	No lubricant on cable	(ss)				
General Oiling	Mobil DTE Oil 26					
Bearing Grease	Mobilux EP No. 1					

* Refer to ... .: Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER		
Flex Couplings	Mobilux EP No. 1					

* Refer to [illegible] Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	CHECK	INSP.
DRUMMING STATION BRIDGE & HOIST		Aux/Op.		MHE-200-1	As Specified	
Hoist Gear Case	Mobil Compound DD					
Trolley Motor Gear	MobilDTE Oil Ex. Hvy.					
Housing						
Hoisting Cable	No Lubricant on Cable					
Bearings	Mobilux EP No. 1					
Open Trolley Gears	Mobiltac E					

* Refer to ... Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION		
				PROCEDURE NUMBER	CHECK	INSP
CONTAINMENT CRANE - HYDRAULIC						
Bridge Brake	Mobilux EP No. 1	Cont/Op		MHE-100-2	As Specified	
Pillow Block	" " " "					
Sheave Pin	" " " "					
Thrust Bearing	" " " "					
BRIDGE						
Wheel Bearing	Mobilux EP No. 1					
Sheave Nest	" " " "					
DRUM						
Shaft Bearings	Mobilux EP No. 1					
TROLLEY						
Wheel Bearings	Mobilux EP No. 1					
BRIDGE						
Drive Gear Case	Mobil DTE Oil Ex Hvy					
Hoist Unit	Mobil DTE Oil Ex Hvy					
TROLLEY						
Drive Gear Case	Mobil STE Oil Ex Hvy					

* Refer to Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ / FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER		
CONTAINMENT CRANE (CON'T)						
HOIST						
Motor Brake	Mobil DTE Oil Ex Hvy					
Wire Rope	Mobiltac MM					
Open Drum Gear	Mobiltac MM					
Trolley Motor Brgs.	Mobilux EP No. 1					
Bridge Motor Brgs.	Mobilux EP No. 1					
Hoist Motor Brgs.	Mobilux EP No. 1					
Vessel Head Lifting Rig			Prior to Refueling			
Internal Lifting Rig			Prior to Refueling			

* Refer to : . : Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	CHECK	INSP.
EQUIP NO. MGE4 PRESSURIZER ROBBINS & MYERS JIB CRANE		Cont/Op				
Hoist Gear Case	Mobil DTE Oil 26			MHE-300-1	As Specified	
Open Gears	Mobiltac E					
Hoist Cable	No Lubrication on Cable					
TROLLEY MOTOR						
Gear Housing	Mobil Compound GG					
Bearings	Mobilux EP No. 1					
POST ACCIDENT AIR HANDLING VALVES					Yearly	Yearly
No Lubrication Required						
CONTAINMENT RECIRCULATING FANS & FILTERS A,B,C,D.	ROT. BLUE GREASE				Yearly	Yearly
CONTROL ROD DRIVE SHROUD COOLING FANS (1A & 1B)		Cont/Op			Yearly	Yearly
Motor Bearings	ROT. BLUE GREASE					

* Refer to Mobil Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	CHECK	INSP
1A & 1B REACTOR COOLANT PUMP		Cont/Basement			Yearly	Yearly
Pump Bearings	Injection Water Lubricated			M-11.8.B/F/G/H		
Motor	Mobil DTE Oil 25			M-11.8.J/K		
Oil Lift Pump Motor	Sealed			M-45.2		
1A & 1B SUMP PUMPS (WEIMAN)		Cont/Basement			Yearly	Yearly
Pump Bearings	Mobilux EP No. 1					
Motor Bearings	Sealed					
Coupling	Dry					
REACTOR COMPARTMENT COOLING UNITS		Cont/Basement			Yearly	Yearly
Motor Bearings	Rot. Blue Grease					
Fan Bearings	Rot. Blue Grease					
P&H HOISTS ON (3)						
Reactor Head		Cont/Cavity			As Required	
Motor Bearings	Mobil DTE BB					
Gear Case	Mobil DTE BB					

* Refer to [illegible] Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	CHECK	INSP.
CONTAINMENT CHARCOAL FILTER FANS & FILTERS (1A & 1B)		Cont/Inter			Yearly	Yearly
Motor Bearings	Sealed					
Fan Bearings	Mobilux EP No. 2					
Chain Falls and Lugalls			N/A	MHE-700 Series MHE-900 Series	As Required	
Fork Lifts			N/A			Monthly
A.V.T. CONDENSATE BOOSTER PUMPS (1A, 1B & 1C)		Turb/Bsmt			Yearly	Yearly
Motor Bearings	Mobilux EP No. 2					
Pump Bearings	Mobil DTE No. 797					
STANDBY AUX. FEEDWATER PUMPS (1C & 1D)		Aux./Addit.			Yearly	Yearly
Motor Bearings	Mobil DTE No. 797					
Pump Bearings	Mobil DTE No. 797					
Coupling	Mobilux EP No. 0					
						*

* Refer to Mobil Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period	
R-13/14 RADIATION SAMPLE PUMP						
Motor Bearings	Sealed	Inter/Top	3M-38	M-11.28	6 Month	
Fan Bearings	Temco High Temp Sealed					
R-11/12 RADIATION SAMPLE PUMP						
Motor Bearings	Sealed	Inter/Top	3M-38	M-11.28	6 Month	
Fan Bearings	Temco High Temp					
R-10A RADIATION SAMPLE PUMP						
Motor Bearings	Sealed	Inter/Top	3M-37	M-11.28	Yearly	
R-10B RADIATION SAMPLE PUMP	Sealed	Inter/Top	3M-37	M-11.28	Yearly	

* Refer to [illegible], Lubrication Instruction Code PH-40

EQUIPMENT	LUBRICANT	BLDG./ FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION	
				PROCEDURE NUMBER	Inspection Period
AVP-2A ACID PUMP					
Pump Bearings	Pulsalube Oil	AVT	3M-39	M-11.22	Yearly
Motor Bearings	Mobilux EP No. 2				
AVP-2B ACID PUMP					
Pump Bearings	Pulsalube Oil	AVT	3M-39	M-11.22	Yearly
Motor Bearings	Mobilux EP No. 2				
AVA-1 AIR BLOWER (Sunflow Blower - Sundstrand Co.)					
Gearbox	Type A Dexron ATF	AVT	3M-39		Yearly
Motor Bearings	Mobilux EP No. 2		3M-45		
AVP-3A CAUSTIC PUMP					
Pump Bearings	Pulsalube Oil	AVT	3M-39	M-11.22	Yearly
Motor Bearings	Mobilux EP No. 2				
AVP-3B CAUSTIC PUMP					
Pump Bearings	Pulsalube Oil	AVT	3M-39	M-11.22	Yearly
Motor Bearings	Mobilux EP No. 2				

* Refer to [illegible] Lubrication Instruction Cal[illegible]

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period
AVP-4 DILUTE ACID PUMP					
Pump Bearings	DTE 797	AVT	3M-40	M-11.19	Yearly
Motor Bearings	Mobilux EP No. 2				
AVP-5 DILUTE CAUSTIC PUMP					
Pump Bearings	DTE 797	AVT	3M-40	M-11.19	Yearly
Motor Bearings	Mobilux EP No. 2				
AVH-10 SAMPLE SINK CHILLER PUMP (Scot Pump-Ardox Corp.)					
Motor	Sealed	Turb/Bsmt	3M-43		Yearly
Pump	Self Lubricated				
AVP-1A SLUICE PUMP					
Pump Bearings	DTE 797	AVT	3M-40	M-11.19	Yearly
Motor Bearings	Mobilux EP No. 2				
AVP-1B SLUICE PUMP					
Pump Bearings	DTE 797	AVT	3M-40	M-11.19	Yearly
Motor Bearings	Mobilux EP No. 2				

* Refer to [illegible] Lubrication Instruction Code

EQUIPMENT	LUBRICANT	BLDG./ / FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	Inspection Period	
AVP-7 WASTE TRANSFER PUMP (LOW)						
Pump Bearings	DTE 797	AVT	3M-40	M-11.19	Yearly	
Motor Bearings	Mobilux EP No.2					
AVP-7 WASTE TRANSFER PUMP (HIGH)						
Pump Bearings	DTE 797	AVT	3M-40	M-11.19	Yearly	
Motor Bearings	Mobilux EP No. 2					
AVP-10A SUMP PUMP						
Motor Bearings	Mobilux EP No. 2	AVT	3M-45	M-11.32	Bi-Yearly	
Pump Bearings	Mobilux EP No. 2		3M-41			
AVP-10B SUMP PUMP						
Motor Bearings	Mobilux EP No. 2	AVT	3M-45	M-11.32	Bi-Yearly	
Pump Bearings	Mobilux EP No. 2		3M-41			

Refer to [illegible] Lubrication Instruction Code [illegible]

EQUIPMENT	LUBRICANT	BLDG./FLOOR	3 MONTH SURVEILLANCE * PERIOD	MAINTENANCE INSPECTION PROCEDURE NUMBER	MAINTENANCE INSPECTION Inspection Period	
AVP-6 AMMONIA RECYLCE PUMP						
Motor Bearings	Sealed	AVT	3M-43		Yearly	
Pump Bearings	Sealed					
AVP-11 HOT WATER SUPPLY PUMP						
Motor Bearings	Sealed	AVT	3M-43	M-11.19	Yearly	
Pump Bearings	Sealed					

Refer to [illegible] Lubrication Instruction Code PM-44

INDEX

INSTRUCTION CODE

CODE FOR 3 MONTH LUBRICATION SURVEILLANCE

3 M - 37 Surveillance of Direct Drive Fans & Motors

(1) Grease motor bearings 1 - 2 shots

(2) Check fan & motor for noise & vibration

:Lubrication should be done while equipment is running

3 M - 38 Surveillance of Belt Driven Fans & Motors

(1) Grease motor bearings 1 - 2 shots

(2) Grease fan bearings 1 - 2 shots

:Lubrication should be done while equipment is running

(3) Observe belt condition & tension & note

3 M - 39 Surveillance of Hydraulic & Gear Case Pumps

(1) Check level in gear case

(2) Check level in hydraulic reservoir

(3) Check for oil leaks

(4) Check for fluid leaks on pump valves

3 M - 40 Surveillance of Pumps w/Oil Reservoirs

(1) Check oil level in automatic oiler

(2) Check mechanical seal for leakage

(3) Check for oil leaks

:When adding oil, check instructions, for filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)

3 M - 41 Surveillance of Pumps w/Greased Bearings

(1) Grease pump bearings 2 shots

(2) Check mechanical seal for leakage

:Grease pump bearing when unit is running if possible

3 M - 42 Surveillance of Motors w/Oil Reservoirs

(1) Check motor bearing oil levels

(2) Check oil for contamination

3 M - 43 Surveillance & Check of Units Where Pump & Motor Are Integral

(1) Check for pump seal leak

(2) Grease motor - where applicable - 1 shot per brg.

3 M - 44 Surveillance of Pump & Gear Cases w/Common Oil Sump

(1) Check oil tank level

(2) Check oil pumps & piping for leakage

(3) Check pump & gears being lubricated for oil leaks

(4) Sample oil for water content

3 M - 45 Surveillance of Motors w/Greased Brgs.

(1) Grease motors - 2 shots

:Grease while running if possible

:Do Not over grease use discretion

3 M - 46 Surveillance of Pumps Lubricated by Fluid Being Pumped

(1) Check for pump seal leakage

3 M - 47 Surveillance of Diesel Engines

(1) Check engine crank case level

(2) Check governor case oil level

(3) Check air motor auto lubricator reservoir level (Norgen Micro Fog)

(4) Check for water & oil leaks

3 M - 48 Surveillance of Gear Drives, Torque Converters & Chain Drives

(1) Check oil level in reduction & gear cases

(2) Check for oil leaks

(3) Check chains for proper tension & smooth operation

(4) Check chain lubricant .

GINNA STATION
UNIT #1
COMPLETED

DATE:

TIME:

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-53.2 REV. NO. 6

THREE MONTH LUBRICATION AND MAINTENANCE INSPECTION

TECHNICAL REVIEW

PORC 4/30/79

TRSchuler
Q/C REVIEW

5-15-79
DATE

APPROVED FOR USE

Bruce Snow
PLANT SUPERINTENDENT

5-16-79
DATE

QA X NON-QA ____ CATEGORY ____

THIS PROCEDURE CONTAINS 30 PAGES

LIFETIME ____ NONPERMANENT ____

REC. CENTRAL RECORDS DATE ____

REVIEWED BY ____ DATE ____

DISP. DATE ____

ADMINISTRATIVE PROCEDURE A-53.2

THREE MONTH LUBRICATION AND MAINTENANCE INSPECTION

1.0 PURPOSE:

1.1 This list is to document the lubrication inspection and any minor maintenance performed in conjunction with it. The original copy of the inspection report shall be forwarded to Central Records after review by the Maintenance Supervisor.

2.0 REFERENCES:

2.1 A-53.0, Preventive Maintenance Program.

2.2 A-53.1, Equipment Inspection Period and Lubricant List.

3.0 INSTRUCTIONS:

3.1 Complete the attached surveillance sheets at the times specified in the Preventive Maintenance Schedule (Ref. 2.1).

Inaccessible equipment during the period of inspection may be marked N/A and omitted.

Refer to A-53.1 for proper lubricant to use.

4.0 RECORDS

4.1 A copy of the 3 month lubrication schedule shall be submitted to Central Records by the Maintenance Engineer when completed.

3 MONTH LUBRICATION SURVEILANCE AND MAINTENANCE

UILDING - AUXILIARY

EQUIPMENT	DATE	A	B	C	COMMENT
MPONENT COOLING PUMPS 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check packing for leakage					
Grease pump bearings when unit is running if possible					
WASTE CONDENSATE TANK PUMPS 3M 40					
(1) Check oil level in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)					
EACTOR MAKEUP PUMP 3M 40					
(1) Check oil level in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM - L6H Section 2, Page 6)					
ONITOR TANK PUMP 3M 40					
(1) Check oil level in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)					

BUILDING - AUXILIARY

EQUIPMENT	DATE	A	B	C	COMMENT
RES.. JAL HEAT REMOVAL PUMPS 3M 40					
(1) Check oil levels in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
: When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL ALM -L6H Section 2, Page 6)					
SUMP TANK PUMPS 3M 40					
(1) Check oil level in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL ALM -L6H Section 2, Page 6)					
SUMP PUMPS 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check mechanical seal for leakage					
: Grease pump bearing when unit is running if possible					
REACTOR COOLANT DRAIN TANK PUMPS					
Canned pump					
SPENT FUEL PIT PUMP 3M 40					
(1) Check oil level in sight glass					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					

3 MONTH LUBRICATION SURVEILANCE AND MAINTENANCE

A-53.2:4

DING - AUXILIARY

EQUIPMENT	DATE	A	B	C	COMMENT
2 FUEL PIT PUMP (Cont'd)					
LING WATER PURIFICATION PUMP 3M 40					
Check oil level in automatic oiler					
Check mechanical seal for leakage					
Check for oil leaks					
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2 Page 6)					
RECIRCULATION PUMP 3M 40					
Check oil level in sight glass					
Check packing for leakage					
Check for oil leaks					
TRIPPER FEED PUMPS					
ned Pump					
Y INJECTION PUMPS 3M 40					
Check oil level in automatic oiler					
Check mechanical seal for leakage					
Check for oil leaks					

BUILDING - AUXILARY

EQUIPMENT	DATE	A	B	C	COMMENT
SAFETY INJECTION PUMPS (Cont'd)					
• When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)					
CHARGING PUMPS 3M 39					
(1) Check level in gear case					
(2) Check level in					
(3) Check for oil leaks					
(4) Check for fluid leaks on pump valves					
(5) Check varidrive belts for signs of wear					
WASTE EVAPORATOR FEED PUMP 3M 40					
(1) Check oil level in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
• When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)					
CONENSATE RETURN PUMP #2 3M 43					
(1) Check for pump seal leak					
CONTAINMENT SPRAY PUMPS 3M 40					
(1) Check oil in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
• When adding oil, check instructions, For Filling Automatic Oiler (Goulds					

DING - AUXILARY

EQUIPMENT	DATE	A	B	C	COMMENT
AINMENT SPRAY PUMPS (Cont'd)					
(Cont'd)Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)					
GING PUMP LEAKOFF PUMPS 3M 39					
) Check level in gear case					
) Check in hydraulic reservoir					
) Check for oil leaks					
) Check for fluid leaks on pump valves					
ENSATE RETURN PUMP #1 3M 43					
Check for pump seal leak					
TRATES HOLDING TANK TRANSFER PUMPS					
ned Pump					
COMPRESSORS 3M 41					
Check mechanical seal for leakage					
Grease pump bearing when unit is running if possible					
OAL FILTER EXHAUST FANS 3M 38					
Grease fan bearings 1-2 shots					
Lubrication should done while equipment is running					
Observe belt condition, tension and note					

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

BUILDING - AUXILARY

EQUIPMENT	DATE	A	B	C	COMMENT
BORIC ACID TRANSFER PUMPS					
Canned Pump					
PENETRATION COOLING FANS 3M 37					
(1)Grease motor bearings 1-2 shots					
(2) Check fan motor for noise and vibration					
: Lubrication should be done while equipment is running					
BORIC ACID BATCH TANK PUMP					
Canned Pump					
AUXILARY BUILDING SUPPLY FANS 3M 38					
(1) Grease motor bearings 1-2 shots					
(2) Grease fan bearings 1-2 shots					
Lubrication should be done while equipment is running					
(3) Observe belt condition, tension and note					
BALING MACHINES 3M 39					
(1) Check level in hydraulic reservoir					
(2) Check for oil leaks					
(3) Check for fluid leaks on pump valves					
AUXILARY BUILDING EXHAUST FAN 1G 3M 37					
(1) Grease motor bearings 1-2 shots					
(2) Check fan and motor for noise and vibration					
: Lubrication should while equipment is running					

3 MONTH LUBRICATION SURVEILANCE AND MAINTENANCE

A-53.2:8

BUILDING - AUXILARY

EQUIPMENT	DATE	A	B	C	COMMENT
CHARGING PUMP ROOM FANS ØM 38					
(1) Grease fan bearings 1 - 2 shots					
(2) Observe belt condition, tension and note.					
Lubrication should be done while equipment is running if possible.					
SAFETY INJECTION PUMP FANS 3M 38					
(1) Grease fan bearings 1 - 2 shots					
(2) Observe belt condition, tension and note					
Lubrication should be done while equipment is running if possible					
RESIDUAL HEAT REMOVAL PIT FANS 3M 38					
(1) Grease fan bearings 1- 2 shots					
(2) Observe belt condition, tension and note.					
Lubrication should be done while equipment is running if possible.					
STANDBY AUX FEEDWATER PUMPS 3M 40/42					
(1) Check motor bearing oil levels					
(2) Check oil for contamination					
(3) Check oil level in automatic oilers					
(4) Check Mechanical seals for leakage					
(5) Check for oil leaks					

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

BUILDING - SERVICE A-53.2:9

EQUIPMENT	DATE	A	B	C	COMMENT
SEWAGE PUMPS 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check packing for leakage					
Grease pump bearings when unit is running if possible					
DEGASIFIER VACUUM PUMP 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check mechanical seal for leakage					
Grease pump bearing when unit is running if possible					
DEGASIFIER BOOSTER PUMP 3M 41					
(1) Check packing for leakage					
Grease pump bearing when unit is running if possible					
D.I. RECIRC. PUMP 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check packing for leakage					
Grease pump bearing when unit is running if possible					
CONDENSATE RETURN PUMP 3M 43					
(1) Check for pump seal leak					

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

DING - SERVICE A-53.2:10

EQUIPMENT		DATE	A	B.	C	COMMENT
TOR HOT WATER PUMP	3M 41					
Grease pump bearings 2 shot						
Check packing for leakage						
Grease pump bearing when unit is running if possible						
RY AND HOT SHOWER SUPPLY PUMP	3M 41					
Grease pump bearings 2 shots						
Check mechanical seal for leakage						
Grease motor bearings 1 - 2 shots						
E SINK COLLECTION PUMP	3M 43					
Check for pump seal leak						
IC UMP	3M 39					
Check level in gear case						
Check level in hydraulic reservoir						
Check for oil leaks						
Check for fluid leaks on pump valves						
PUMP	3M 39					
Check level in gear case						
Check level in hydraulic reservoir						
Check for oil leaks						
Check for fluid leaks on pump valves						
Grease motor bearings 1 - 2 shots						
TION TANK RECIRCULATION PUMP	3M 41					
Grease pump bearings 2 shots						
ck mechanical seal for leakage						
Grease pump bearing when unit is running if possible						

BUILDING - SERVICE

EQUIPMENT	DATE	A	B	C	COMMENT
TENTION TANK SAMPLE PUMP 3M 43					
(1) Check for pump seal leak					
UNDRY HOT WATER TANK RECIRCULATION PUMP 3M 42					
(1) Check motor bearing oil					
(2) Check mechanical seal for leakage.					
EUTRALIZING TANK RECIRC. PUMP 3M 40					
1) Check for pump seal leak					
(2) Check oil level in automatic oiler					
(3) Check for oil leaks When adding oil check instruction for filling automatic oiler (Goulds Pump Manual 8268-EL Sup. LHG Sect. 2 page 6)					
DENSATE RETURN PUMP ON CAUSTIC HEAT EXCHANGER 3M 42					
1) Check packing for leakage					

EQUIPMENT	DATE	A	B	C	D	E	COMMENT
VICE BUILDING AIR HANDLING UNITS 3M 38							
1) Grease fan bearings 1 - 2 shots							
2) Observe belt condition, tension and note.							
Lubrication should be done while equipment is running if possible.							

EQUIPMENT	DATE	A	B	C	COMMENT
t Water Boiler Recirculating Pumps 3M 43					
(1) Check Motor Bearing Oil					
(2) Check Mechanical Seal for leakage					

UILDING - INTERMEDIATE

EQUIPMENT	DATE	A	B	C	COMMENT
UXILARY FEED PUMP (Motor Driven) 3M40-42-44					
(1) Check oil level in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
When adding oil, check instructions, For Filling Automatic Oiler (Worthington Manual, 2134-E1B, Page 12, Section V)					
(4) Check motor bearing oil levels					
(5) Check oil for contamination					
(6) Check gear-case level					
(7) Check oil pumps and piping for leakage					
(8) Check pump and gears being lubricated for oil leaks					
(9) Sample oil for water content					
XILARY FEED PUMP (Turbine Driven) 3M 40-44)					
(1) Check ~~oil~~ levels in automatic oiler					
(2) Check mechanical seal for leakage					
(3) Check for oil leaks					
When adding oil, check instructions For Filling Automatic Oiler, (Worthington Manual, 2134-E1B, Page 12, Section V)					
(4) Check oil tank level					
(5) Check oil pumps and piping for leakage					
(6) Check pump and gears being lubricated for oil leaks					
(7) Sample oil for water content					

BUILDING - INTERMEDIATE

EQUIPMENT		DATE	A	B	C	COMMENT
SPENT FUEL PIT SKIMMER PUMP	3M 40					
(1) Check oil level in automatic oiler						
(2) Check mechanical seal for leakage						
(3) Check for oil leaks						
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)						
CHEMICAL DRAIN TANK PUMP	3M 40					
(1) Check oil level in automatic oiler						
(2) Check mechanical seal for leakage						
(3) Check for oil leaks						
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM L6H Section 2, Page 6						
LAUNDRY AND HOT SHOWER TANK PUMP	3M 40					
(1) Check oil level in automatic oiler						
(2) Check mechanical seal for leakage						
(3) Check for oil leaks						
When adding oil, check instructions, For Filling Automatic Oiler (Goulds Pump Manual 8268-EL SUP. 7731 EL ALM-L6H Section 2, Page 6)						

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

UILDING - INTERMEDIATE

EQUIPMENT	DATE	A	B	C	COMMENT
GENERATOR SETS 3M 45					
(1) Grease motors - 2 shots					
(2) Grease while running if possible					
Do Not over grease use discretion					
ILLED WATER PUMPS 3M 43					
(1) Check for pump seal leak					
SE HEATING BOILER FEED PUMPS 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check mechanical seal for leakage					
Grease pump bearing when unit is running if possible					
NDENSATE RETURN PUMP 3M 43					
(1) Check for pump seal leak					
TERMEDIATE BUILDING SUMP PUMP 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check mechanical seal for leakage					
Grease pump bearing when unit is running if possible					
NTAINMENT PURGE SUPPLY FANS 3M 38					
(1) Grease fan bearings 1 - 2 shots					
Lubrication should be done while equipment is running					
(2) Observe belt condition, tension and note					

EQUIPMENT	DATE	A	B	C	COMMENT
IENT PURGE EXHAUST FANS 3M 38.					
rease fan bearings 1 - 2 shots					
ıbrication should be done while quipment is running					
ɔserve belt condition, tension and ɔte					
?Y BUILDING MAIN EXHAUST FANS 3M 37-42					
rease fan bearings 1 - 2 shots					
ıeck fan and motor for noise and vibration					
ıbrication should be done while quipment is running					
ıeck motor bearing oil levels					
ıe oil for contamination					
?Y BUILDING DECON AND SPENT FUEL .UST FAN 1-C 3M 38					
ease fan bearings 1 - 2 shots					
ıbrication should be done while quipment is running					
ɔserve belt condition, tension and ɔte					
)IATE BUILDING EXHAUST FANS 3M 38					
ease fan bearings 1 - 2 shots					
ıbrication should be done while quipment is running					

BUILDING - INTERMEDIATE

EQUIPMENT	DATE	A	B	C	D	COMMENT
INTERMEDIATE BUILDING EXHAUST FANS (Cont'd)						
[illegible]) Observe belt condition, tension and note						
INTERMEDIATE BUILDING SUPPLY FAN 1-C 3M 38						
(1) Grease fan bearings 1 - 2 shots						
[illegible] Lubrication should be done while equipment is running						
(2) Observe belt condition, tension and note						
CONTROL ACCESS FANS 3M 38						
(1) Grease fan bearings 1 - 2 shots						
(2) Observe belt condition, tension and note.						
R-11/12, 13/14 RADIATION SAMPLE PUMPS 3M-38						
(1) Observe belt condition, tension and note.						
R-10 RADIATION SAMPLE PUMPS 3M-37						
(1) Check fan/motor for noise and vibration.						

BUILDING - SCREEN HOUSE

A-53.2:17

EQUIPMENT	DATE	A	B	C	COMMENT
CONDENSER CIRCULATION WATER PUMPS 3M 42					
(1) Check motor bearing oil levels					
(2) Check oil for contamination					
FIRE SERVICE WATER PUMP (Electric) 3M 42-45					
(1) Check motor bearing oil levels					
(2) Check oil for contamination					
(3) Grease motor bearing - 2 shots					
Grease while running if possible					
*Do Not over grease use discretion					
DIESEL FIRE SERVICE WATER PUMP 3M 39-47					
(1) Check level in gear case					
(2) Check level in radiator					
(3) Check for oil leaks					
(4) Check for fluid leaks on pump valves					
(5) Check engine crankcase level					
(6) Check for oil and water leaks					

EQUIPMENT	DATE	A	B	C	D	COMMENT
SERVICE WATER COOLING PUMPS 3M 42-45						
(1) Check motor bearing oil levels						
(2) Check oil for contamination						
(3) Grease motor bearing 2 shots						
Grease while running if possible						
Do Not over grease use discretion						

BUILDING - SCREEN HOUSE

EQUIPMENT	DATE	A	B	C	COMMENT
RAVELING SCREENS 3M 48				D	
(1) Check oil level in reduction					
(2) Grease idler sprocket and shaft bearings					
(3) Check for oil leaks					
(4) Check chains for proper tension and smooth operation					
(5) Check chain lubricant					
ANAL SAMPLE PUMP 3M 43					
(1) Check for pump seal leak					
ILORINE PUMPS 3M 39					
(1) Check level gear case					
(2) Check level in hydraulic reservoir					
(3) Check for oil leaks					
(4) Check for fluid leaks on pump valves					
NDENSATE RETURN TANK PUMP (Boiler) 3M 43					
(1) Check for packing leakage					
(2) Grease motor -where applicable - 1 shot per bearing					
MP PUMPS					
Submersible (Sealed)					

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

A-53.2:19

NG - TURBINE

EQUIPMENT	DATE	A	B	C	COMMENT
SER PIT. SUMP PUMP (East) 3M 41					
Grease pump bearings 2 shots					
Check mechanical seal for leakage					
Grease pump bearing when unit is running if possible					
ATER BOOSTER PUMPS 3M 43					
Check for pump seal leak					
Grease motor - where applicable - 1 shot per bearing					
E OIL CIRCULATION PUMP (Bowser) 3M 46					
Check for pump seal leakage					
SATE PUMPS 3M 42					
Check motor bearing oil levels					
Check mechanical seal for leakage					
DRAIN PUMPS 3M 42					
Check motor bearing oil levels					
Check mechanical seal for leakage					
E AIR COMPRESSOR 3M 40-45					
Check oil level in automatic oiler					
Check mechanical seal for leakage (Open side cover to check)					
Check for oil leaks					
Grease motor - 2 shots					
Grease while running if possible					
Do Not over grease, use discretion					
MENT AIR COMPRESSORS 3M 40-45					
Check oil levels					
Check mechanical seal for leakage					

3 MONTH LUBRICATION SURVEILANCE AND MAINTENANCE

A-53.2:20

)ING - TURBINE

EQUIPMENT	DATE	A	B	C	COMMENT
RUMENT AIR COMPRESSORS (Cont'd)					
C..ck for oil leaks					
Grease motor 2 - shots					
Grease while running if possible					
Do Not over grease, use discretion					
SERVICE BOOSTER PUMP 3M 41					
Grease pump bearings 2 shots					
Check packing for leakage					
Grease pump bearing when unit is running if possible					
WN TRANSFER PUMP 3M 41					
Grease pump bearings 2 shots					
Check packing for leakage					
Grease pump bearing when unit is r..ning if possible					
E OIL TANK VAPOR EXTRACTORS 3M 37					
Check fan and motor for noise and vibration					
Lubrication should be done while equipment is running					
EN DRIER BLOWER 3M 37					
Check fan and motor for noise and vibration					
Lubrication should be done while equipment is running					

ING - TURBINE

EQUIPMENT	DATE	A	B	C	COMMENT
OL ROOM AIR HANDEING UNIT SUPPLY FAN 3M 38					
Grease motor bearings - 1 -2 shots					
Grease fan bearings 1 - 2 shots					
Lubrication should be done while equipment is running					
OL ROOM AIR HANDLING UNIT EXHAUST FAN 3M 38					
Grease fan bearings 1 - 2 shots					
Lubrication should be done while equipment is running					
HATE PUMPS 3M 39					
(1) Check level in gear case					
Check packing for leakage					
Check for oil leaks					
Check for fluid leaks on pump valves					
ZINE PUMP 3M 39					
Check level in gear case					
Check level in hydraulic reservoir					
Check for oil leaks					
Check for fluid leaks on pump valves					
ALINE PUMP 3M 39					
Check level in gear case					
Check level in hydraulic reservoir					
Check for oil leaks					
Check for fluid leaks on pump valves					
SEAL CONDENSER VENT FAN 3M 37					
Grease motor bearings 1 - 2 shots					

EQUIPMENT	DATE	A	B	C	COMMENT
GLAND SEAL CONDENSER VENT FAN (Cont'd)					
Check fan and motor for noise and vibration					
Lubrication should be done while equipment is running					
GENERATOR SEAL OIL VAPOR EXTRACTOR FAN 3M 37					
(1) Check fan and motor for noise and vibration					
Lubrication should be done while equipment is running					
PHOSPHATE PUMPS (Metering) 3M 39					
(1) Check level in gear case					
(2) Check packing for leakage					
Check for oil leaks					
(4) Check for fluid leaks on pump valves					
TURBINE E - H GOVERNOR OIL PUMPS 3M 43					
(1) Check for pump seal leaks					
TURBINE OIL TRANSFER PUMP 3M 46					
(1) Check for pump seal leakage					
DIESEL GENERATOR AIR START COMPRESSORS 3M 40					
(1) Check oil level					
(2) Check for oil leaks					
(3) Observe belt condition					

3 MONTH LUBRICATION SURVEILANCE AND MAINTENANCE

BUILDING - TURBINE

EQUIPMENT	DATE	A	B	C	COMMENT
TURNING GEAR DRIVE 3M 42					
(1) Check motor bearing oil levels					
(2) Check oil contamination					
MAIN FEEDWATER PUMPS 3M 42-44					
(1) Check motor bearing oil levels					
(2) Check oil for contamination					
(3) Check oil tank level					
(4) Check oil pumps and piping for leakage					
(5) Check pump and gears being lubricated for oil leaks					
(6) Sample oil for water content					
FEEDWATER PUMP SEAL DRAIN PUMPS 3M 41					
(1) Grease pump bearings 2 shots					
(2) Check packing for leakage					
VACUUM PRIMING PUMPS 3M 41-42					
(1) Check packing for leakage					
(2) Check motor bearing oil levels					
( ) Check oil for contaminations					
CONDENSER PIT SUMP PUMPS (West) 3M 41					
( ) Grease pump bearings 2 shots					
(2) Check mechanical seal for leakage					
Grease pump bearings when unit is running if possible					

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

- TURBINE

A-53.2:24

EQUIPMENT		DATE	A	B	C	COMMENT
SATE RETURN PUMP	3M 43					
ir handling room for Control Room) ec or pump seal leak						
SEAL OIL PUMPS A C	3M 43					
eck for pump seal leak.						
N SEAL OIL PUMPS D C	3M 43					
eck for pump seal leak						
TE TRANSFER PUMP	3M 41					
ease pump bearings 2 shots						
ec mechanical seal for leakage						
ease pump bearing when unit is nning if possible						
R HOTWELL SAMPLE PUMPS						
, Pumps						
OM AIR CONDITIONING UNITS	3M 38					
Oil motor bearings 1 -2 shots						
Oil fan bearings 1 - 2 shots						
brication shold be done while uipment is shut off						
serve belt condition, tension and te						

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE A-53.2:25

BUILDING - TURBINE

EQUIPMENT	DATE	A	B	C	COMMENT
DIESEL GENERATOR FUEL OIL TRANSFER PUMPS 3M 46					
(1) Check for pump seal leakage					
DIESEL GENERATOR UNITS 3M 47					
(1) Check engine crankcase level					
(2) Check governor case oil level					
(3) Check automatic lubricator reservoir level (Norgren Micro Fog)					
(4) Check for water and oil leaks					
BUS COOLER FANS 3M 38					
(1) Grease fan bearings 1 - 2 shots Lubrication should be done while equipment is running if possible.					
(2) Observe belt condition, tension and note.					
CONTROL ROOM CHARCOAL RECIRCULATION FAN 3M 38					
(1) Grease fan bearings 1 - 2 shots Lubrication should be done while equipment is running if possible.					
(2) Observe belt condition, tension and note.					
AVT CONDENSATE BOOSTER PUMPS 3M 40/45.					
(1) Grease motors - 2 shots : Grease while running if possible : Do not over grease use discretion					
(2) Check oil levels in automatic oilers					
(3) Check packing for excessive leakage					
(4) Check for oil leaks					

BUILDING - Containment

EQUIPMENT	DATE	A	B	C	COMMENT
Reactor Coolant Pumps A & B 3M 42					
(1) Check Motor Bearing Oil Levels					
(2) Check Oil For Contamination					
(3) Check For Oil Leaks					
Containment Sump Pumps A & B 3M 41					
(1) Grease pump bearings 2Shots					
(2) Check mechanical seal for leakage					
: Grease pump bearings when unit is running if possible					
Control Rod Shroud Fans A & B 3M 37					
(1) Grease motor bearings 1-2 Shots					
(2) Check fan motor for noise and vibration					
: Lubrication should be done while equipment is running					
Reactor Compartment Cooling Fans A & B 3M 38					
(1) Grease fan bearings 1-2 Shots					
(2) Grease motor bearings 1-2 Shots					
: lubrication should be done while equipment is running					
Containment Recirculating Fans ABC & D 3M 38				D	
(1) Grease Fan bearings 1-2 Shots					
(2) Grease motor bearings 1-2 Shots					
: Eqiipment should be greased while running if possible					
Containment Charcoal Filter Fans A & B 3M 38					
(1.) Grease motor bearings 1-2 Shots					
: Lubrication should be done while equipment is running if possible					
(2)Observe belt condition, tension & Note					

BUILDING - WAREHOUSE

EQUIPMENT	DATE	A	B	C	D	COMMENT
HEA...G BOILER HOT WATER CIRCULATION PUMPS 3M 43						
(1) Check motor bearing oil						
(2) Check mechanical seal for leakage						

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

BUILDING - AVT

EQUIPMENT	DATE	A	B	C	COMMENT
AVP - ACID PUMP 3M-39					
1) Check level in gear case					
2) Check level in hydraulic reservoir					
3) Check for oil leaks					
4) Check for fluid leaks on pump valves					
AVA - AIR BLOWER 3M-39/45					
1) Check level in gear case					
2) Check for oil leaks					
3) Grease motor bearings 1-2 shots Lubricate while equipment is running.					
AVP - CAUSTIC PUMP 3M-39					
1) Check level in gear case					
2) Check level in hydraulic reservoir					
3) Check for oil leaks					
4) Check for fluid leaks on pump valves					
AVP - DILUTE ACID PUMP 3M-40					
1) Check oil level in automatic oiler					
2) Check mechanical seal for leakage					
3) Check for oil leaks when adding oil, check instructions for filling automatic oiler.					

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

BUILDING - AVT

EQUIPMENT	DATE	A	B	C	COMMENT
AVP - DILUTE CAUSTIC PUMP 3M-40					
1) Check oil level in automatic oiler					
2) Check mechanical seal for leakage					
3) Check for oil leaks . When adding oil, check instructions for filling automatic oiler.					
AVH - SAMPLE SINK CHILLER PUMP 3M-43					
1) Check for pump seal leak					
AVP - SLUICE PUMP 3M-40					
1) Check oil level in automatic oiler					
2) Check mechanical seal for leakage					
3) Check for oil leaks. When adding oil, check instructions for filling automatic oiler.					
AVP - WASTE TRANSFER PUMP 3M-40					
1) Check oil level in automatic oiler					
2) Check mechanical seal for leakage					
3) Check for oil leaks. When adding oil, check instructions for filling automatic oiler.					

3 MONTH LUBRICATION SURVEILLANCE AND MAINTENANCE

BUILDING - AVT

EQUIPMENT	DATE	A	B	C	COMMENT
AVP - SUMP PUMP 3M-41/45					
1) Grease pump bearings 1-2 shots					
2) Grease motor bearings 1-2 shots Lubricate while equipment is running.					
AVP - AMMONIA RECYCLE PUMP 3M-43					
1) Check for pump leak					
AVP - HOT WATER SUPPLY PUMP 3M-43					
1) Check for pump seal leak					

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-53.3 REV. NO. 0

VALVE PREVENTIVE MAINTENANCE PROGRAM

TECHNICAL REVIEW

PORC 12/17/79

Mark Shaw
QC REVIEW

12/28/79
DATE

APPROVED FOR USE

Bruce Snow
PLANT SUPERINTENDENT

12-28-79
DATE

QA X NON-QA ____ CATEGORY 1.0

REVIEWED BY: ____

THIS PROCEDURE CONTAINS 56 PAGES

A-53.3

VALVE PREVENTIVE MAINTENANCE PROGRAM

1.0 PURPOSE:

1.1 The purpose of this procedure is to outline the preventive maintenance program for valves at Ginna Station.

2.0 REFERENCES:

2.1 Rockwell Edwards Service Manual.

2.2 Aloyco Maintenance Manual on manually operated gate valves. Also Aloyco self actuated swing check valves, manually operated globe valves and motor operated gate valves.

2.3 Copes Vulcan Instruction Manual on diaphragm operated valves.

2.4 Grinnell Instructions and Maintenance Manual.

2.5 Fisher -Continental Instruction Sheets.

2.6 Crosby Nozzle Relief Manual. Also: Crosby Safety Relief Manual.

2.7 Kero Test Instruction Manual for nuclear valves.

2.8 Velan Service Manual for Velan hand and motor operated valves. Also: Velan Instruction Manual for motor operated, bolted bonnet, gate, and stop check valves.

2.9 Masoneilan - Worthington - Maintenance Instruction Manual.

2.10 ASCO Instruction and Maintenance Manual for solenoid and diaphragm valves.

2.11 American National Standard N18-7-1972, Administrative Controls for Nuclear Power Plants.

2.12 Safety Guide 33, Quality Assurance Program Requirements.

3.0 INSTRUCTIONS:

3.1 General Description

The Preventive Maintenance Program provides a schedule for maintenance, inspection and replacement of valves indicated in the program.

In addition to this maintenance inspection, the valves are being monitored on a more frequent basis by Operations personnei.

3.1 (Cont'd)

In the event of equipment failure or possible malfunction, trouble cards are initiated as described in A-18, Multileaf Trouble Report and Work Order, and actions also may be taken as directed by A-25.1 Reporting of Unusual Plant Conditions. Visual leakage, visual vibration, and operating noise levels are monitored by the operator on his routine rounds. Valve performance is also monitored during its usage and noticeable degradations are reported. Performance of safety-related equipment is also monitored by the Results and Test Department during performance of the Surveillance Testing Program.

3.2 Program Responsibilities and Review:

The Pipefitter Foreman is responsible for the implementation of the program. The Maintenance Supervisor or his designee will check the schedule on a monthly basis to ensure it is being followed. The Shop Foreman will note any preventive maintenance performed during the previous week.

A Report or completed procedure will be submitted for any major inspection performed, to the Maintenance Engineer. Any significant deviation (greater than 25%) from the prescribed period of the program will require approval of the Maintenance Engineer, and a Ginna Station Change in Procedure Request Form shall be initiated for approval.

The overall program will be reviewed annually by the Maintenance Supervisor and Pipefitter Foreman for the content and updating to maintenance experiences. During the year changes may be made by use of the Ginna Station Change in Procedure Request Form.

3.3 Preventive Maintenance Inspection Schedule

Schedule attached.

3.4 Valve Inspection Period

See A-53.4.

3.5 The specified inspection intervals for the valve shall be within the time periods identified in A-53.3 from the starting date, January 1, 1980, and shall be continued at the identified frequency.

3.6 Records:

None

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
872A	ROCKWELL	3/4"C58	SI1501R	W/B	CHECK		VISUAL	1 YEAR	
872B	ROCKWELL	3/4"C58	SI1501R	W/B	CHECK		VISUAL	1 YEAR	
2854	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
887	CROSBY	3/4"x1"	SI1501R	BOLTED	RELIEF	RSSP-12 M-37.18.1	VISUAL TEST	1 YEAR 10 YEARS	
878A	VELAN	2" MOV	SI1501R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
878B	VELAN	2" MOV	SI1501R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
878C	VELAN	2" MOV	SI1501R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
878D	VELAN	2" MOV	SI1501R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
2841	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2842	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
828A	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
828B	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
HCV 945	COPES VULCAN	2" RD54R	SI903R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
828A	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
828B	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2842	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
880B	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
880C	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2838	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
2843	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2845	ROCKWELL	3/4"T58	SI2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
843A	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
843B	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
838A	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
838B	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
841	DARLING	10/8/10	SI2501R	BOLTED	GATE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
865	DARLING	10/8/10	SI2501R	BOLTED	GATE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
842A	DARLING	10" C482	SI2501R	BOLTED	CHECK	M-37.14	VISUAL INSP.INTER	1 YEAR 10 YEARS	
842B	DARLING	10" C482	SI2501R	BOLTED	CHECK	M-37.13	VISUAL INSP.INTER	1 YEAR 10 YEARS	
844A	COPES VULCAN	1"ID56R	SI902R	BOLTED	GLOBE AOV	M-37.43 M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
844B	COPES VULCAN	1"ID56R	SI902R	BOLTED	GLOBE AOV	M-37.43 M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
835A	COPES VULCAN	1"ID56R	SI1501R	BOLTED	GLOBE AOV	M-37.30 M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
835B	COPES VULCAN	1"ID56R	SI1501R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
830A	CROSBY	1"X2"	SI902R	BOLTED	RELIEF	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
830B	CROSBY	1"X2"	SI902R	BOLTED	RELIEF	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
834A	COPES VULCAN	1"ID56R	SI902R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
834B	COPES VULCAN	1"ID56R	SI902R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
878G	ROCKWELL	2"C58	SI2501R	W/B	CHECK		VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
878F	ROCKWELL	2"C58	SI2501R	W/B	CHECK		VISUAL	1 YEAR	
878H	ROCKWELL	2"C58	SI2501R	W/B	CHECK		VISUAL	1 YEAR	
878J	ROCKWELL	2"C58	SI2501R	W/B	CHECK		VISUAL	1 YEAR	
878E	ROCKWELL	2"T58	SI2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
877A	ROCKWELL	2"C58	SI2501R	W/B	CHECK		VISUAL	1 YEAR	
877B	ROCKWELL	2"C58	SI2501R	W/B	CHECK		VISUAL	1 YEAR	
867A	DARLING	10C48Z	SI2501R	BOLTED	CHECK	M-37.29	VISUAL INSP.INTER	1 YEAR 10 YEARS	
867B	DARLING	10"C48Z	SI2501R	BOLTED	CHECK	M-37.28	VISUAL INSP.INTER	1 YEAR 10 YEARS	
840A	COPES VULCAN	3/4"ID58R	SI2501R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
840B	COPES VULCAN	3/4"ID58R	SI2501R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
839A	COPES VULCAN	3/4"ID58R	SI2501R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
339B	COPES VULCAN	3/4"ID58R	SI2501R	BOLTED	GLOBE AOV	M-37.31 M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
855A	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
855B	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
855C	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
855D	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
855E	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
855F	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
855G	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
855H	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2846	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
833A	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
833B	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
886A	ROCKWELL	1"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
832A	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
832B	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
892A	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
892B	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
837A	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
837B	ROCKWELL	2"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2841	ROCKWELL	3/4"T58	SI2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2833	ROCKWELL	3/4"T58	SI2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2832	ROCKWELL	3/4"T58	SI2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2836	ROCKWELL	3/4"T58	SI902R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2837	ROCKWELL	3/4"T58	SI2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2834	ROCKWELL	3/4"T58	SI2501R	W/B	GLOBE (M		PACK	5 YEARS	
							VISUAL	1 YEAR	
2835	ROCKWELL	3/4"T58	SI2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
829A	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	

VALVE	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	COMPLETE DATE
829B	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
852A	VELAN	6" MGTE	SI2501R	BOLTED	GATE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
852B	VELAN	6" MGTE	SI2501R	BOLTED	GATE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
853A	VELAN	6"C57	SI2501R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
853B	VELAN	6"C57	SI2501R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
2860	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2855	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2861	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
866A	ROCKWELL	2"C58	SI301R	W/B	CHECK		VISUAL	1 YEAR	
2862	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2865	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2868	ROCKWELL	2"C58	SI301R	W/B	CHECK		VISUAL	1 YEAR	
2864	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2863	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
875A	VELAN	2"TM58FM	SI301R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
875B	VELAN	2"TM58FM	SI301R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
876A	VELAN	2"TM58FM	SI301R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
876B	VELAN	2"TM58FM	SI301R	W/B	GLOBE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
896A	ALLOY	10"MOV	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL INSP.INTER	1 YEAR 10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	* PERIOD PERIOD	COMPLETE DATE
896B	ALLOY	10"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
825A	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
825B	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
828	ROCKWELL	3/4"C58	SI151R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
826A	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
826B	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
826C	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
826D	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
827A	DARLING	8"G42	SI151R	BOLTED	GATE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
827B	DARLING	8"G42	SI151R	BOLTED	GATE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
890A	ALLOY	4"G42	SI151R	BOLTED	GATE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
890B	ALLOY	4"G42	SI151R	BOLTED	GATE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
HCV 836A	COPES VULCAN	2"GLB	SI301N	BOLTED	GLOBE AOV	M-37.55	VISUAL	1 YEAR	
						M-37.3	INSP.INTER	10 YEARS	
HCV 836B	COPES VULCAN	2"GLB	SI301N	BOLTED	GLOBE AOV	M-37.55	VISUAL	1 YEAR	
						M-37.3	INSP.INTER	10 YEARS	
881B	ROCKWELL	2"T58	SI301N	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
848B	ROCKWELL	3/4"T58	SI301N	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
849A	ROCKWELL	2"T58	SI301N	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
849B	ROCKWELL	2"T58	SI301N	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
849C	ROCKWELL	2"T58	SI301N	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	

VALVE	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
849D	ROCKWELL	2"T58	SI301N	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
848A	ROCKWELL	3/4"T58	SI301N	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
881A	ROCKWELL	2"T58	SI301N	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1802	CROSBY	3/4"X1"	SI301N	BOLTED	RELIEF	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
1813A	ALLOY	6"MGTE	SI151R	BOLTED	MOV	M-37.58	VISUAL INSP.INTER	1 YEAR 10 YEARS	
1813B	ALLOY	6"MGTE	SI151R	BOLTED	MOV	M-37.58	VISUAL INSP.INTER	1 YEAR 10 YEARS	
1810A	ALLOY	6"C42	SI151R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1810B	ALLOY	6"C42	SI151R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
847A	ROCKWELL	2"C58	SI151R	W/B	CHECK		VISUAL	1 YEAR	
899	ROCKWELL	2"T58	SI301N	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1806C	ROCKWELL	1"C58	SI301N	W/B	CHECK		VISUAL	1 YEAR	
863A	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1815A	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL INSP.INTER	1 YEAR 10 YEARS	
1815B	ALLOY	8"MGE	SI151R	BOLTED	GATE MOV	M-37.58	VISUAL INSP.INTER	1 YEAR 10 YEARS	
1820C	ROCKWELL	3/4"T58	SI151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
891C	ROCKWELL	3/4"C58	SI151R	W/B	CHECK		VISUAL	1 YEAR	
1820B	ROCKWELL	3/4"T58	SI151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
891B	ROCKWELL	3/4"C58	SI151R	W/B	CHECK		VISUAL	1 YEAR	
889A	VELAN	3"C57	SI1501R	BOLTED	CHECK	M-37.18K	VISUAL INSP.INTER	1 YEAR 10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
889B	VELAN	3"C57	SI1501R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
2805	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2810	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
888A	VELAN	3"G57	SI1501R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
888B	VELAN	3"G57	SI1501R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
885A	ROCKWELL	T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
870A	VELAN	3"C57	SI1501R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
870B	VELAN	3"C57	SI1501R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
871A	VELAN	3"MGE	SI1501R	BOLTED	GATE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
871B	VELAN	3"MGE	SI1501R	BOLTED	GATE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
2849	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
885B	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
858A	ALLOY	6"G42	SI151R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
858B	ALLOY	6"G42	SI151R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
881D	ROCKWELL	2"T58	SI151R	W/B	GLOBE (M)		PACK VISUAL	1 YEAR 1 YEAR	
881C	ROCKWELL	2"T58	SI151R	W/B	GLOBE (M)		PACK VISUAL	1 YEAR 1 YEAR	
860A	DARLING	6"MGTE	SI301R	BOLTED	MOV GATE	M-37.19	VISUAL INSP.INTER	1 YEAR 10 YEARS	
860B	DARLING	6"MGTE	SI301R	BOLTED	MOV GATE	M-37.19	VISUAL INSP.INTER	1 YEAR 10 YEARS	
860C	DARLING	6"MGTE	SI301R	BOLTED	MOV GATE	M-37.19	VISUAL INSP.INTER	1 YEAR 10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
860D	DARLING	6"MGTE	SI301R	BOLTED	MOV GATE	M-37.19	VISUAL INSP.INTER	1 YEAR 10 YEARS	
862A	ALLOY	6"C54	SI301R	BOLTED	CHECK	M-37.18H	VISUAL INSP.INTER	1 YEAR 10 YEARS	
862B	ALLOY	6"C54	SI301R	BOLTED	CHECK	M-37.18H	VISUAL INSP.INTER	1 YEAR 10 YEARS	
864B	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
831A	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
864A	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
868A	ALLOY	6"G54	SI301R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
868B	ALLOY	6"G54	SI301R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
869A	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
869B	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
884	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
882	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
883	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
880	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
2817	ROCKWELL	3/4"T58	SI151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
861	CROSBY	3/4"X1"	SI151R STAINLESS STEEL	BOLTED	RELIEF	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
1817	CROSBY	3/4"X1"	SI151R STAINLESS STEEL	BOLTED	RELIEF	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
831B	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
859B	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE · PERIOD	
								PERIOD	COMPLETE DATE
847B	ROCKWELL	2"C58	SI301R	W/B	CHECK		VISUAL	1 YEAR	
873A	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
873D	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
873B	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
873C	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
845B	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
845A	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2828	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
880A	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
879	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2818	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2819	ROCKWELL	3/4"58I	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2825	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
891A	ROCKWELL	3/4"C58	SI1501R	W/B	CHECK		PACK VISUAL	5 YEARS 1 YEAR	
1820A	ROCKWELL	3/4"T58	SI1501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
898	COPES VULCAN	1"GLB	SI1501R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
897	COPES VULCAN	1"GLB	SI1501R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
2830	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2826	ROCKWELL	3/4"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
859C	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
859D	ROCKWELL	2"T58	SI301R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
944	AIRCO	1"	SI903N	BOLTED	GLOBE AOV		PACK VISUAL	5 YEARS 1 YEAR	
494A	ROCKWELL	1"T58	SI903N	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2826	ROCKWELL	3/4"T58	SI903N	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2827	ROCKWELL	3/4"T58	SI903N	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2831	ROCKWELL	3/4"T58	SI903N	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
846	COPES VULCAN	1"	SI903N	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
2829	ROCKWELL	3/4"T58	SI903N	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
808	ROCKWELL	3/4"T58	SI151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
856	DARLING	10"MGTE	SI601R	BOLTED	GATE MOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
854	ALLOY	10"C54	SI601R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1121D	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1122D	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1129	GRINNELL	2"X32D	CH152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1679	GRINNELL	2"X32D	CH152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1268F	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1268G	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1129	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
1127	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1272	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1071	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)		VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1123C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1264	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1101C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1100B	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1275C	ASCO	3/8"TS42S	CH151R	BOLTED	GLOBE		VISUAL INSP.INTER	1 YEAR 5 YEARS	
1267	CROSBY	2"X3"	CH151R	BOLTED	RELIEF VALVE	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
1266	CROSBY	2"X3"	CH151R	BOLTED	RELIEF VALVE	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
1265	CROSBY	2"X3"	CH151R	BOLTED	RELIEF VALVE	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
1121C	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1120	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1119	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1104	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1122C	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1122B	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1122A	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1100C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
1652	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1103A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1103B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1103D	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1121B	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1122B	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1122C	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1103C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
361	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
264A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1100A	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1651	GRINNELL	1"X32D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1268A	GRINNELL	3/4"X42D	CH152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1268B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1268C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1268D	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1268E	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1125	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1126	GRINNELL	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD: PERIOD	SURVEILLANCE PERIOD: COMPLETE DATE
1113	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1263	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1101B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1275B	ASCO	3/8"TS42S	CH151R	BOLTED	GLOBE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1275A	ASCO	3/8"TS42S	CH151R	BOLTED	GLOBE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1102	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1121A	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1144	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1297	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1146	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1147	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1145	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1298	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1149	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1150	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1118	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1101A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1100D	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1123A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
1123B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1270	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1271	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1112	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1110	ALLOY	4"C42	CH151R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1109	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1108	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1142B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1114	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1732	ROCKWELL	1"C36	CH151R	W/B	CHECK		VISUAL	1 YEAR	
1148	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
210	GRINNELL	3/4"X42D	CH151R	BOLTED (M)	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
245	GRINNELL	2"X42D	CH151R	BOLTED (M)	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
2275	ROCKWELL	2"C58	CH151R	W/B	CHECK		PACK VISUAL	5 YEARS 1 YEAR	
244	COPES VULCAN	2"WD42R	CH151R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
211	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
212	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
213	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
214	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

			BODY MATERIAL	WELDED BONNET	MANUAL (M)	OR MAINTENANCE PROCEDURE		PERIOD	COMPLETE DATE
215	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
216	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
246	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
220	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
382	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
378	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
379	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
381	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
380	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
226A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
226B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
226C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
241	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
396	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
243	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
238A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
238B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
238C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
227A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK, AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	PERIOD	
								PERIOD	COMPLETE DATE
227B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
227C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
230	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
395	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
229	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
240	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
242	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
237A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
237B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
237C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
236	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
234	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
235	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
233	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
231	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
228	GRINNELL	2"X42D	CH151R	BOLTED	DIAPRHAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
247	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
248C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
397	GRINNELL	2"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
375B	ROCKWELL	2"C58D	CH151N	W/B	CHECK		VISUAL	1 YEAR	
324	GRINNELL	3/4"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
325	GRINNELL	2"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
400	GRINNELL	2"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
401	ROCKWELL	1"C58	CH151N	W/B	CHECK		VISUAL	1 YEAR	
402	GRINNELL	1"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
405	GRINNELL	3/4"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
406	GRINNELL	1"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
375A	ROCKWELL	2"C58	CH151N	W/B	CHECK		VISUAL	1 YEAR	
376C	GRINNELL	2"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
403	GRINNELL	2"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
404	GRINNELL	2"X42D	CH151N	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
346B	GRINNELL	3/4"X42B	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
349B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
347	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
348	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
349C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
390	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
354	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
208A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208D	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208E	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208F	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208G	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208H	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
208J	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
328	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
329	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
331	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
217	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
339	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
333	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
340	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
341	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
342	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
398B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
330B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
330D	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
398A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
344	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
343	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
345	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
2242	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
HCV 104	COPES VULCAN	2"RD42R	CH151R	BOLTED	GLOBE AOV	M-37.61 M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
HCV 105	COPES VULCAN	2"RD42R	CH151R	BOLTED	GLOBE AOV	M-37.61 M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
346A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
330C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
330D	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
330A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
332	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
333	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
334	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
335	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
336	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
337	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
543	ROCKWELL	2"T58	CH2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
LCV 427	COPES VULCAN	2"ID58D	CH2501R	BOLTED	GLOBE AOV	M-37.49	VISUAL	1 YEAR	
						M-37.3	INSP.INTER	10 YEARS	
311C	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
AOV 200A	COPES VULCAN	2"ID58R	CH2501R	BOLTED	GLOBE AOV	M-37.54	VISUAL	1 YEAR	
						M-37.3	INSP.INTER	10 YEARS	
AOV 200B	COPES VULCAN	2"ID58R	CH2501R	BOLTED	GLOBE AOV	M-37.54	VISUAL	1 YEAR	
						M-37.3	INSP.INTER	10 YEARS	
202	COPES VULCAN	2"ID58R	CH2501R	BOLTED	GLOBE AOV	M-37.54	VISUAL	1 YEAR	
						M-37.3	INSP.INTER	10 YEARS	
2201	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2202	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2200	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
203	CROSBY	2"X3"	CH601R	BOLTED	RELIEF VALVE	RSSP-12	VISUAL	1 YEAR	
						M-37.38.1	TEST	3 YEARS	
311D	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2003	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
AOV 371	COPES VULCAN	2"ID56R	CH601R	BOLTED	GLOBE AOV	M-37.3	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
2231	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
369	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
820	ROCKWELL	2"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
204A	ROCKWELL	2"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2232	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
204B	ROCKWELL	2"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
207A	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
207B	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
207C	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2234	ROCKWELL	3/4"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
204C	ROCKWELL	2"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
204D	ROCKWELL	2"T58	CH601R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
204E	ROCKWELL	2"T58	CH151R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
PCV 135	COPES VULCAN	2"RD56D	CH601R	BOLTED	GLOBE AOV	M-37.3	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
987	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		SS SAMPLE VALVE	1 YEAR	
209	CROSBY	2"X3"	CH151R	BOLTED	RELIEF VALVE	RSSP-12	VISUAL	1 YEAR	
						M-37.38.1	TEST	10 YEARS	
TCV 145	COPES VULCAN	2"WD42D	CH151R	BOLTED	GLOBE AOV	M-37.3	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
239A	ROCKWELL	2"C58	CH151R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
210	GRINNELL	3/4"42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
2237	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
974	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
248A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
249	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
250	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
253	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
389	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
251	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
264B	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
264A	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
255A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
255C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
255D	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
247	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
239B	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
367	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
FCV 110B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM AOV	M-37.10	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
365A	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
366	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
365B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
355	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
252	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
248B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
LCV 112A	COPES VULCAN	2WD42R	CH151R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
2274	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	COMPLETE DATE
256	GRINNELL	2"X42D	CH151R	W/B	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
254	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
2234	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
FCV 110C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM AOV	M-37.16A M-37.10	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
255B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
LCV 112C	CONTINENTAL	4"	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
368	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
266	ALLOY	4"C42	CH151R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
268	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
358	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
LCV 112B	CONTINENTAL	4"	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
269	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
267	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
399	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
348	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
280A	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
280B	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
280C	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
2244	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
2245	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
2246	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
FCV 110A	COPES VULCAN	1"RD42D	CH151R	BOLTED	GLOBE AOV	M-37.23 M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
356	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A M-37.16M	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
271	ROCKWELL	1"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
358	FISHER	4"X42B	CH151R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
357	ALLOY	4"C42	CH151R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
349B	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
348C	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
351	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
MOV 350	ALLOY	2"MGTE	CH151R	BOLTED	GATE MOV	M-37.44 M-37.58	VISUAL INSP.INTER	1 YEAR 10 YEARS	
352	ROCKWELL	2"C58	CH151R	W/B	CHECK		VISUAL	1 YEAR	
353	GRINNELL	2"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
280D	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
280E	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
280F	GRINNELL	1"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
292C	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
292D	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
292E	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
2271	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2272	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2273	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
279A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
279B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
279C	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
274	ROCKWELL	3/4"C58A	CH151R	W/B	CHECK		VISUAL	1 YEAR	
276	ROCKWELL	3/4"C58A	CH151R	W/B	CHECK		VISUAL	1 YEAR	
278	ROCKWELL	3/4"C58A	CH151R	W/B	CHECK		VISUAL	1 YEAR	
2240	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
283	CROSBY	3/4"X1"	CH2502R	BOLTED	RELIEF VALVE	RSSP-12 M-37.18.1	VISUAL TEST	1 YEAR 10 YEARS	
284	CROSBY	3/4"X1"	CH2502R	BOLTED	RELIEF VALVE	RSSP-12 M-37.18.1	VISUAL TEST	1 YEAR 10 YEARS	
285	CROSBY	3/4"X1"	CH2502R	BOLTED	RELIEF VALVE	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
287	VELAN	3"T58	CH2502R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
288	VELAN	3"T58	CH2502R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
291	VELAN	3"T58	CH2502R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
281A	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
281B	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
281C	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	PERIOD	
								PERIOD	COMPLETE DATE
281E	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
281F	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
281G	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
281H	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
281I	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
281J	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
281K	KERO TEST	3/8"T58	CH2502R	BOLTED	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
281L	KERO TEST	3/8"T58	CH2502R	BOLTED	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
289	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
290	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
286	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
299A	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
299B	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
303A	ROCKWELL	2"X58N	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
299C	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
303D	ROCKWELL	2"X58N	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
299D	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
277A	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
277B	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	COMPLETE DATE
275	ROCKWELL	3"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
303C	ROCKWELL	2"X58N	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
303B	ROCKWELL	2"X58N	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
298A	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
298B	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
300A	ROCKWELL	1"X58N	CH2502R	W/B	NEEDLE GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
300B	ROCKWELL	1"X58N	CH2502R	W/B	NEEDLE GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2225	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2224	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
301A	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
301B	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2229	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
323	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
304B	ROCKWELL	2"C58	CH2502R	W/B	CHECK		PACK VISUAL	5 YEARS 1 YEAR	
304A	ROCKWELL	2"C58	CH2502R	W/B	CHECK		PACK VISUAL	5 YEARS 1 YEAR	
2217	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
302C	ROCKWELL	2"C58	CH2502R	W/B	CHECK		VISUAL	1 YEAR	
302D	ROCKWELL	2"C58	CH2502R	W/B	CHECK		VISUAL	1 YEAR	
2216	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
							PACK	5 YEARS	
304D	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
304C	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
302B	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
302A	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
308A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
308B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
309A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
309B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
206A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
206B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
307A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
307B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							VISUAL	1 YEAR	
270A	COPES VULCAN	2"ID58D	CH2501R	BOLTED	GLOBE (AOV)	M-37.3	INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
270B	COPES VULCAN	2"ID58D	CH2501R	BOLTED	GLOBE (AOV)	M-37.3	INSP.INTER	10 YEARS	
							PACK	5 YEARS	
305A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
305B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
306A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
306B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
293A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
293B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
288A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
288B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
317A	ROCKWELL	3/4"C58	CH2501R	W/B	CHECK		VISUAL	1 YEAR	
317B	ROCKWELL	3/4"C58	CH2501R	W/B	CHECK		VISUAL	1 YEAR	
362A	ROCKWELL	2"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
385A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
385B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
318A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
318B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2313	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
320B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
386	COPES VULCAN	1"ID58R	CH2501R	BOLTED	GLOBE (AOV)	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
311B	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2212	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
544	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
310	COPES VULCAN	3/4"ID58R	CH2501R	BOLTED	GLOBE (AOV)	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
2211	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
311H	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD: PERIOD	SURVEILLANCE PERIOD: COMPLETE DATE
311G	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
HCV 123	COPES VULCAN	3/4"RD58R	CH2501R	BOLTED	GLOBE (AOV)	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
312	COPES VULCAN	3/4"WD42D	CH2501R	BOLTED	GLOBE AOV 3-WAY	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
311A	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
314	CROSBY	2"X3"	CH151R	BOLTED	RELIEF VALVE	RSSP-12 M-37.38.1	VISUAL TEST	1 YEAR 10 YEARS	
313	ALLOY	3"MGTE	CH151R	BOLTED	GATE MOV	M-37.58	VISUAL INSP.INTER	1 YEAR 10 YEARS	
315A	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
315B	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
315C	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
319A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
319B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
316B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
316A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
265	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
321	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
394	GRINNELL	3"X42D	CH151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
384A	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
384B	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
384C	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
HCV 142	COPES VULCAN	2"RD58D	CH2502R	BOLTED	GLOBE (AOV)	M-37.3	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
2230	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
370B	ROCKWELL	2"C58	CH2502R	W/B	CHECK		PACK	5 YEARS	
							VISUAL	1 YEAR	
370A	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
362C	ROCKWELL	2"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
311E	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
311F	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2208	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
294	COPES VULCAN	2"ID58R	CH2501R	BOLTED	GLOBE AOV	EM-214 M-37.25	VISUAL	1 YEAR	
						EM-213 M-37.3	INSP.INTER	10 YEARS	
392A	COPES VULCAN	2"ID58R	CH2501R	BOLTED	GLOBE AOV	M-37.25	VISUAL	1 YEAR	
						M-37.3	INSP.INTER	10 YEARS	
393	ROCKWELL	2"C58	CH2501R	W/B	CHECK		VISUAL	1 YEAR	
295	ROCKWELL	2"C58	CH2501R	W/B	CHECK		VISUAL	1 YEAR	
296	COPES VULCAN	2"ID58R	CH2501R	BOLTED	GLOBE AOV	M-37.25 M-37.3	VISUAL	1 YEAR	
						EM-236	INSP.INTER	10 YEARS	
297	ROCKWELL	2"C58	CH2501R	W/B	CHECK		VISUAL	1 YEAR	
2204	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2205	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
2206	ROCKWELL	3/4"T58	CH2501R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
292A	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
292B	ROCKWELL	3/4"T58	CH2502R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
392B	COPES VULCAN	2"ID58R	CH2502R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
950	ROCKWELL	3/4"T58	SL2505R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
951	MASONEILAN	3/8"GLB	SL2505R	BOLTED	GLOBE AOV	M-37.36.4	VISUAL INSP.INTER	1 YEAR 10 YEARS	
966A	MASONEILAN	3/8"GLB	SL2505R	BOLTED	GLOBE AOV	M-37.36.4	VISUAL INSP.INTER	1 YEAR 10 YEARS	
956F	NUPRO	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
956G	NUPRO	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
956C	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
961A	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
962A	BLANK	3/8"CAP	SL2505R						
963A	BLANK	3/8"CAP	SL2505R						
964A	NUPRO	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
981	KEROTEST	3/8"C58	SL2505R	BOLTED	CHECK VALVE		INSP.INTER VISUAL	10 YEARS 1 YEAR	
965C	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
985	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
999E	KEROTEST	3/8"T58	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
952	ROCKWELL	3/4"T58	SL2505R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
953	MASONEILAN	3/8"GLB	SL2505R	BOLTED	GLOBE AOV	M-37.36.4	VISUAL INSP.INTER	1 YEAR 10 YEARS	
956E	NUPRO	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
956H	NUPRO	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
966B	MASONEILAN	3/8"GLB	SL2505R	BOLTED	GLOBE AOV	M-37.36.4	VISUAL INSP.INTER	1 YEAR 10 YEARS	
956A	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
961B	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
962B	BLANK	3/8"CAP	SL2505R						
963B	BLANK	3/8"CAP	SL2505R						
964B	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
965B	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
982	KEROTEST	3/8"C58	SL2505R	BOLTED	CHECK		INSP.INTER VISUAL	10 YEARS 1 YEAR	
986	KEROTEST	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
954	ROCKWELL	3/4"GLOBE	SL2505R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
955	MASONEILAN	3/8"GLB	SL2505R	BOLTED	GLOBE AOV	M-37.36.4	VISUAL INSP.INTER	1 YEAR 10 YEARS	
997	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
998	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
999A	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
956D	NUPRO	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
956J	NUPRO	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
999C	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
903	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
904	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
905	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
906	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
908A	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
908B	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
910A	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
910B	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
907	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
911B	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
911A	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
909A	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
909B	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
999B	WHITEY	3/8"GLOBE	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
966C	MASONEILAN	3/8"GLB	SL2505R	BOLTED	GLOBE AOV	M-37.36.4	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
956B	WHITEY	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
961C	KEROTEST	3/8"GLB	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
962C	BLANK	3/8"CAP	SL2505R	BOLTED	GLOBE (M)				
963C	BLANK	3/8"CAP	SL2505R						
964C	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
965A	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
983	KEROTEST	3/8"C58	SL2505R	BOLTED	CHECK		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
968	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
969	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
991	ROCKWELL	3/4"T58	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	1 YEAR	
971	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
972	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
984	KEROTEST	3/8"C58	SL2505R	BOLTED	CHECK		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
999D	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
967A	KEROTEST	3/8"T58	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
967B	KEROTEST	3/8"T58	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
967C	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
958	ROCKWELL	3/4"T58	SL2505R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
959	MASONEILAN	3/8"GLB	SL2505R	BOLTED	GLOBE AOV	M-37.36.4	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
960	KEROTEST	3/8"C58	SL2505R	BOLTED	CHECK		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
957	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
974	ROCKWELL	3/4"T58	SL2505R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	
989	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
972	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
987	ROCKWELL	3/4"T58	SL2505R	W/B	GLOBE (M)		PACK	5 YEARS	
							VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
							VISUAL	1 YEAR	
988	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
994A	WHITEY	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							PACK	5 YEARS	
975	ROCKWELL	3/4"T58	SL2505R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							VISUAL	1 YEAR	
977	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE		INSP.INTER	10 YEARS	
978	BLANK	3/8"CAP	SL2505R						
979	BLANK	3/8"CAP	SL2505R						
							PACK	5 YEARS	
980	ROCKWELL	3/4"T58	SL2505R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							VISUAL	1 YEAR	
992A	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
992B	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
992E	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
995A	KEROTEST	3/8"C58	SL2505R	BOLTED	CHECK VALVE		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
996A	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
992C	WHITEY	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
992D	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
992F	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
995B	KEROTEST	3/8"C58	SL2505R	BOLTED	CHECK VALVE		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
996B	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
993A	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
993B	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		INSP.INTER	10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
990	KEROTEST	3/8"	SL2505R	BOLTED	GLOBE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
1685	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1637	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1638A	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1646A	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1645A	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1646B	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1645B	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1639	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1640	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1648A	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1648B	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1647A	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1647B	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
257	CROSBY	2"X3"	CH151R	BOLTED	RELIEF VALVE	RSSP-12 M-37.38.1	VISUAL INSP.INTER	1 YEAR 10 YEARS	
975	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
205B	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
258	ROCKWELL	3/4"T58	CH151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
205A	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
							VISUAL	1 YEAR	
254	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1275D	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
260	GRINNELL	3/4"X42D	CH151R	BOLTED	DIAPHRAM	M-37.16A	CHANGE DIA	5 YEARS	
						RSSP-12	TEST	1 YEAR	
1621	CROSBY	1"X2"	WD-152R	BOLTED	RELIEF	M-37.38.1	VISUAL	10 YEARS	
						RSSP-12	VISUAL	1 YEAR	
1622	CROSBY	1"X2"	WD-152R	BOLTED	RELIEF	M-37.38.1	TEST&INSP.	10 YEARS	
						RSSP-12	VISUAL	1 YEAR	
1624	CROSBY	1"X2"	WD-152R	BOLTED	RELIEF	M-37.38.1	TEST&INSP.	10 YEARS	
						RSSP-12	VISUAL	1 YEAR	
1623	CROSBY	1"X2"	WD-152R	BOLTED	RELIEF	M-37.38.1	TEST&INSP.	10 YEARS	
PCV			CARBON STEEL			M-37.10	VISUAL	1 YEAR	
1037A	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.16A	CHANGE DIA	5 YEARS	
PCV			CARBON STEEL			M-37.10	VISUAL	1 YEAR	
1036A	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.16A	CHANGE DIA	5 YEARS	
PCV			CARBON STEEL			M-37.10	VISUAL	1 YEAR	
1039A	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.16A	CHANGE DIA	5 YEARS	
PCV			CARBON STEEL			M-37.10	VISUAL	1 YEAR	
1038A	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1607A	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1607B	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1607C	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1607D	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1633	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1634	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1635	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1636	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
1625	ROCKWELL	1"XC36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1626	ROCKWELL	1"XC36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1627	ROCKWELL	1"XC36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1628	ROCKWELL	1"XC36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1617	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1618	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1619	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1620	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656A	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656B	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656C	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656D	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1659A	ROCKWELL	3/4"C36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1659B	ROCKWELL	3/4"C36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1659C	ROCKWELL	3/4"C36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1659D	ROCKWELL	3/4"C36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
PCV 1038B	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM AOV	M-37.16A M-37.10	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
PCV 1037B	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM AOV	M-37.16A M-37.10	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
PCV 1039B	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM AOV	M-37.16A M-37.10	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
PCV						M-37.16A	VISUAL	1 YEAR	
1036B	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM AOV	M-37.10	CHANGE DIA	5 YEARS	
		WEIR				M-37.16A M37.10	VISUAL	1 YEAR	
1629	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.18B	CHANGE DIA	5 YEARS	
		WEIR				M-37.16A M3710	VISUAL	1 YEAR	
1630	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.18B	CHANGE DIA	5 YEARS	
		WEIR				M-37.16A M37.10	VISUAL	1 YEAR	
1631	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.18B	CHANGE DIA	5 YEARS	
		WEIR				M-37.16A M37.10	VISUAL	1 YEAR	
1632	GRINNELL	1"XA32R	WD-152R	BOLTED	DIAPHRAM AOV	M-37.18B	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1606A	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1606B	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1606C	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1606D	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1610H	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1617A	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
PCV						M-37.16A	VISUAL	1 YEAR	
1040	GRINNELL	2"	WD-152R	BOLTED	DIAPHRAM AOV	M-37.10	CHANGE DIA	5 YEARS	
RCV						M-37.16A	VISUAL	1 YEAR	
014	FISHER	2"	WD-152R	BOLTED	GLOBE AOV	M-37.10	CHANGE DIA	5 YEARS	
PCV						M-37.16A	VISUAL	1 YEAR	
1022	GRINNELL	3/8"	WD-2505R	BOLTED	DIAPHRAM AOV	M-37.10	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1670	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1672	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1610F	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1679	GRINNELL	2"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1613	GRINNELL	2"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
1611	GRINNELL	2"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1651	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1664	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1665	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1669	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1652	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1667	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1612	GRINNELL	2"X42D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
205B	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1643	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1668	ROCKWELL	3/4"C36	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1615A	GRINNELL	3/4"X32D	WD-152P	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1615B	GRINNELL	3/4"X32D	WD-152P	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1615D	GRINNELL	3/4"X32D	WD-152P	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1269	GRINNELL	2"X42D	WD-152P	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656A	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656B	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656C	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1656D	GRINNELL	3/4"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
1659A	ROCKWELL	3/4"C58	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1659B	ROCKWELL	3/4"C58	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1659C	ROCKWELL	3/4"C58	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
1659D	ROCKWELL	3/4"C58	WD-152R	BOLTED	CHECK	M-37.18C	VISUAL	1 YEAR	
2203	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1675	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
980	ROCKWELL	3/4"T58	WD-152R	BOLTED	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1641	GRINNELL	1"X42D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1642	GRINNELL	1"X42D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
2780	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
719A	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
719B	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
822B	ROCKWELL	2"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
854	ALLOY	10"C54	AC601R	BOLTED BONNET	CHECK VALVE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
856	DARLING	10"MGE	AC601R	BOLTED	MOV GATE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
851A	DARLING	10"MGE	AC601R	BOLTED	MOV GATE	M-37.47	VISUAL INSP.INTER	1 YEAR 10 YEARS	
851B	DARLING	10"MGE	AC601R	BOLTED	MOV GATE	M-37.47	VISUAL INSP.INTER	1 YEAR 10 YEARS	
852A	VELAN	6"MGTE	AC601R	BOLTED	MOV GATE	M-37.53	VISUAL INSP.INTER	1 YEAR 10 YEARS	
852B	VELAN	6"MGTE	AC601R	BOLTED	MOV GATE	M-37.53	VISUAL INSP.INTER	1 YEAR 10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
HCV 133	COPES VULGAN	2"AOV	AC601R	BOLTED	GLOBE AOV	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
702	ROCKWELL	3/4"C58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
703	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2203	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
807B	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
807C	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
807D	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
807E	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
807F	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
807G	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
FCV 626	CONTINENTAL	6"BUTT	AC601R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
HCV 625	CONTINENTAL	8"BUTT	AC601R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
HCV 624	CONTINENTAL	8"BUTT	AC601R	BOLTED	BUTTERFLY		VISUAL INSP.INTER	1 YEAR 10 YEARS	
712B	ALLOY	6"G54	AC601R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
717	VELAN	8"G56	AC601R	BOLTED	GATE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
715	VELAN	8"G56	AC601R	BOLTED	GATE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
2778	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
705B	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
705A	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
							PACK	5 YEARS	
711D	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
705C	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
711E	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							VISUAL	1 YEAR	
704A	DARLING	10"X54RG	AC601R	BOLTED	GATE MOV		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
704B	DARLING	10"X54RG	AC601R	BOLTED	GATE MOV		INSP.INTER	10 YEARS	
							PACK	5 YEARS	
822A	ROCKWELL	2"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							VISUAL	1 YEAR	
850A	DARLING	10"MGTE	AC601R	BOLTED	GATE MOV		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
850B	DARLING	10"MGTE	AC601R	BOLTED	GATE MOV		INSP.INTER	10 YEARS	
							PACK	5 YEARS	
705D	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							VISUAL	1 YEAR	
857A	DARLING	6"MGTE	AC601R	BOLTED	MOV GATE		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
857B	DARLING	6"MGTE	AC601R	BOLTED	MOV GATE		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
857C	DARLING	6"MGE	AC601R	BOLTED	MOV GATE		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
1816A	ALLOY	6"G54	AC601R	BOLTED	GATE (M)		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
1816B	ALLOY	6"G54	AC601R	BOLTED	GATE (M)		INSP.INTER	10 YEARS	
							PACK	5 YEARS	
1829C	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
1829D	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
1829A	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
1829B	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	
							PACK	5 YEARS	
718A	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
718B	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
958	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2779	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
712A	ALLOY	6"G54	AC601R	BOLTED	GATE M		VISUAL INSP.INTER	1 YEAR 10 YEARS	
714	VELAN	8"G56	AC601R	BOLTED	GATE M		VISUAL INSP.INTER	1 YEAR 10 YEARS	
2781	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
1724	ROCKWELL	2"C58	AC-151R	W/B	CHECK		VISUAL	1 YEAR	
1725	ROCKWELL	2"C54	AC-151R	W/B	CHECK		VISUAL	1 YEAR	
1811A	ROCKWELL	2"G54	AC-151R	W/B	GATE		PACK VISUAL	5 YEARS 1 YEAR	
1811B	ROCKWELL	2"G54	AC-151R	W/B	GATE		PACK VISUAL	5 YEARS 1 YEAR	
1812A	ROCKWELL	2"C58	AC601R	W/B	CHECK		VISUAL	1 YEAR	
1812B	ROCKWELL	2"C58	AC601R	W/B	CHECK		VISUAL	1 YEAR	
716	VELAN	8"G56	AC601R	BOLTED	GATE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
706A	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE MANUAL		PACK VISUAL	5 YEARS 1 YEAR	
710A	ALLOY	8"C54	AC601R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
711C	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
709A	ALLOY	8"X54RG	AC601R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
709C	ALLOY	8"54RG	AC601R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	
709D	ALLOY	8"54RG	AC601R	BOLTED	GATE (M)		VISUAL INSP.INTER	1 YEAR 10 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
711B	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
710B	ALLOY	8"C54	AC601R	BOLTED	CHECK		VISUAL INSP.INTER	1 YEAR 10 YEARS	
706B	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
711A	ROCKWELL	3/4"T58	AC651R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
807A	ROCKWELL	3/4"T58	AC651R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
700	VELAN	10"MGTE	RC2501R	BOLTED	MOV GATE	EM-235 EM-204	VISUAL INSP.INTER	1 YEAR 10 YEARS	
701	VELAN	10"MGTE	RC2501R	BOLTED	MOV GATE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
720	VELAN	10"MGTE	RC2501R	BOLTED	MOV GATE		VISUAL INSP.INTER	1 YEAR 10 YEARS	
721	VELAN	10"MGTE	RC2501R	BOLTED	MOV GATE	M-37.50 EM-158	VISUAL INSP.INTER	1 YEAR 10 YEARS	
2765	ROCKWELL	3/4"T58	RC2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2764	ROCKWELL	3/4"T58	RC2501R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2763	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2786	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2747	ROCKWELL	3/4"T54	AC250R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2848	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2853	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
2840	ROCKWELL	3/4"T58	AC601R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
521	MASONEILAN	3/8"GLB	WD2505R	BOLTED	GLOBE AOV		VISUAL INSP.INTER	1 YEAR 10 YEARS	
523	ROCKWELL	3/4"T58	WD2505R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
524	ROCKWELL	3/4"T58	WD2505R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
541	ROCKWELL	2"T58	WD-151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
503	ROCKWELL	2"T58	WD-151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
507	ROCKWELL	2"T58	WD-151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
540	ROCKWELL	2"T58	WD-151R	W/B	GLOBE (M)		PACK VISUAL	5 YEARS 1 YEAR	
555	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
560	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
527	COPES VULCAN	2"ID42RS	WD-152R	BOLTED	GLOBE	M-37.3	VISUAL INSP.INTER	1 YEAR 10 YEARS	
1716	GRINNELL	1"X32D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1789	KEROTEST	3/8"	WD2505R				INSP.INTER VISUAL	10 YEARS 1 YEAR	
1655	KEROTEST	3/8"T58	WD2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
1717	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1609	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1713	GRINNELL	3/4"C36	WD-152R	BOLTED	CHECK	M-37.18D	PACK VISUAL	5 YEARS 1 YEAR	
1793	GRINNELL	3/4"X42D	WD-152R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1655	KEROTEST	3/8"T58	WD2505R	BOLTED	GLOBE (M)		INSP.INTER VISUAL	10 YEARS 1 YEAR	
1717	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1609	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1711	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL DIA CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
1712	CROSBY	1"X2"	WD-151R	BOLTED	RELIEF	RSSP-12	VISUAL	1 YEAR	
						M-37.38.1	TEST	10 YEARS	
1714	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1715	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
526	COPES VULCAN	2"ID42R	WD-151R	BOLTED	GLOBE AOV	M-37.3	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
312	COPES VULCAN	3/4"WD42D	WD-151R	BOLTED	GLOBE AOV	M-37.3	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
1721	GRINNELL	3"	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1723	GRINNELL	3"	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1728	GRINNELL	3"	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1072	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
LCV 1003B	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM AOV	M-37.16A	VISUAL	1 YEAR	
						M-37.10	CHANGE DIA	5 YEARS	
1709G	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1810A	ALLOY	6"C42	WD-151R	BOLTED	CHECK		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
1810B	ALLOY	6"C42	WD-151R	BOLTED	CHECK		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
1813A	ALLOY	6"MGE	WD-151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
1813B	ALLOY	6"MGE	WD-151R	BOLTED	GATE MOV	M-37.58	VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
1759	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1760	ROCKWELL	2"C58	WD-151R	W/B	CHECK	M-37.18E	PACK	5 YEARS	
							VISUAL	1 YEAR	
1757	GRINNELL	2"X42D	WD-151R	BOLTED	CHECK	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1758	ROCKWELL	2"C58	WD-151R	W/B	DIAPHRAM	M-37.18E	PACK	5 YEARS	
							VISUAL	1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
1003	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1724	ROCKWELL	2"C58	WD-151R	W/B	CHECK		PACK	5 YEARS	
							VISUAL	1 YEAR	
1725	ROCKWELL	2"C58	WD-151R	W/B	CHECK		PACK	5 YEARS	
							VISUAL	1 YEAR	
1726	ROCKWELL	2"T58	WD-151R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
1727	ROCKWELL	2"T58	WD-151R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
1078B	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1725B	ROCKWELL	2"C58	WD-151R	W/B	CHECK		PACK	5 YEARS	
							VISUAL	1 YEAR	
1724B	ROCKWELL	2"C58	WD-151R	W/B	CHECK		PACK	5 YEARS	
							VISUAL	1 YEAR	
1811A	ROCKWELL	2"T58	WD-151R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
1811B	ROCKWELL	2"T58	WD-151R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
1812A	ROCKWELL	2"C58	WD-151R	W/B	CHECK		PACK	5 YEARS	
							VISUAL	1 YEAR	
1812B	ROCKWELL	2"C58	WD-151R	W/B	CHECK		PACK	5 YEARS	
							VISUAL	1 YEAR	
2785	ROCKWELL	3/4"T58	WD-151R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
2784	ROCKWELL	3/4"T58	WD-151R	W/B	GLOBE		PACK	5 YEARS	
							VISUAL	1 YEAR	
1708A	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1733	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
798B	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	
1730	ALLOY	3"C42	WD-151R	BOLTED	CHECK		VISUAL	1 YEAR	
							INSP.INTER	10 YEARS	
1100	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL	1 YEAR	
							CHANGE DIA	5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
1731	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1759	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1754A	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1754B	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1756	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1738	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1739	GRINNELL	3"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1741	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1743	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1729	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1754	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1708C	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1722C	GRINNELL	1"T58	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1746	ROCKWELL	1"T58	WD-151R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1747	ROCKWELL	1"T58	WD-151R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1761	ROCKWELL	1"T36	WD-151R	W/B.	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1752	ROCKWELL	1"T36	WD-151R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1701	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1659	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
							VISUAL	1 YEAR	
1742	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1732	POWELL	3/4"GATE	WD-151R	BOLTED	GATE		INSP.INTER	10 YEARS	
							VISUAL	1 YEAR	
1708D	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1751	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1709D	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1709E	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1744	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1740	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1755	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1750	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1748	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
9147	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
9148	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
9146	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1749	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
2606	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1610B	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1219	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	
							VISUAL	1 YEAR	
1784	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	CHANGE DIA	5 YEARS	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD PERIOD	 COMPLETE DATE
1703	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1719	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1720	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1791	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1710	ROCKWELL	1"C58	WD-151R	W/B	CHECK		VISUAL	1 YEAR	
1718	ROCKWELL	1"C58	WD-151R	W/B	CHECK		VISUAL	1 YEAR	
1706	ROCKWELL	1"T58	WD-151R	W/B	GLOBE		VISUAL	1 YEAR	
1707	GRINNELL	1"T58	WD-151R	W/B	GLOBE		VISUAL	1 YEAR	
1708E	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1650B	ROCKWELL	1"C58	WD-151R	W/B	CHECK		VISUAL	1 YEAR	
1654H	ROCKWELL	1"C58	WD-151R	W/B	CHECK		VISUAL	1 YEAR	
1650	ROCKWELL	1"C58	WD-151R	W/B	CHECK		VISUAL	1 YEAR	
1650B	ROCKWELL	1"C58	WD-151R	W/B	CHECK		VISUAL	1 YEAR	
1654G	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1769	ROCKWELL	1"C58	WD-151R	W/B	CHECK	M-18.3	VISUAL	1 YEAR	
1736	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1735	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1737	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1788	ROCKWELL	1"T58	WD-151R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	

VALVE #	MANUFACTURER	STYLE	LINE SPEC AND BODY MATERIAL	BOLTED OR WELDED BONNET	CHECK AOV MOV MANUAL (M)	ISOLATION AND OR MAINTENANCE PROCEDURE	REMARKS	SURVEILLANCE PERIOD	
								PERIOD	COMPLETE DATE
2602	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
2603	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
2604	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1616	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1792	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1610A	GRINNELL	2"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1762	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1654F	GRINNELL	1"X42D	WD-151R	BOLTED	DIAPHRAM (M)	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1790	GRINNELL	3/4"X42D	WD-151R	BOLTED	DIAPHRAM	M-37.16A	VISUAL CHANGE DIA	1 YEAR 5 YEARS	
1653	ROCKWELL	1"C58	WD-151R	W/B	CHECK		VISUAL	1 YEAR	
1654D	ROCKWELL	1"T58	WD-151R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	
1654C	ROCKWELL	1"T58	WD-151R	W/B	GLOBE		PACK VISUAL	5 YEARS 1 YEAR	

GINNA STATION
UNIT #1
COMPLETED

DATE:-

TIME:-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-54.4 REV. NO. 11

DUTY ENGINEER RESPONSIBILITIES

TECHNICAL REVIEW

PORC 12/17/79

TRSchuler
QC REVIEW

12-19-79
DATE

APPROVED FOR USE

Bruce A Snow
PLANT SUPERINTENDENT

12-21-79
DATE

QA x NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 9 PAGES

A-54.4

DUTY ENGINEER RESPONSIBILITIES

1.0 PURPOSE:

1.1 This procedure outlines the Ginna Station Duty Engineer weekly Plant tour and random backshift or weekend assessment of operations.

2.0 REFERENCES:

2.1 Ginna Station Administrative and Engineering Staff Responsibilities, A-54.

3.0 INSTRUCTIONS:

3.1 During the Plant tour, the Duty Engineer should visually examine the general appearance, potential fire hazards, potential breach of security and unusual circumstances. Also, check for outdated, unapproved and uncontrolled drawings or procedures.

3.1.1 Potential fire hazard inspection should include but not be limited to random checking that:

- garbage cans are covered
- fire extinguishers are being checked periodically
- fire doors are properly closed
- Applicable Activities are in accordance with A-54.3, Open Flame, Grinding, and Welding Permit.
- Temporary structures are of non-flammable material
- housekeeping
- combustable materials are being safely stored and handled
- no evidence exists of smoking in restricted areas

3.1.2 Potential break of security inspection should include but not be limited to random checking that:

- Windows and/or doors secured in accordance with applicable requirements
- New or temporary installations which would compromise security

3.2 If any unusual conditions are encountered, the conditions should be corrected immediately or trouble card turned in for correction.

3.3 The Weekly Plant Tour should include, but not be limited to, the following areas: (make comments as desired)

a. Turbine Building (Emphasis on: Condenser Pit, Turbine Oil Reservoir, and Seal Oil Unit Area).
Remarks, if desired:

Maint. Work Order's Trouble Report No.
(If submitted) ______________

b. Oil Storage Room
Remarks, if desired:

Maint. Work Order's Trouble Report No.
(If submitted) ______________

c. A, B Diesel Generator Rooms
Remarks, if desired:

Maint. Work Order's Trouble Report No.
(If submitted) ______________

d. Gas Cylinder Storage Area
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

e. Relay Room
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

f. Computer Room
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

g. A, B Battery Rooms
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

h. Air Handling Room. (Control Room)
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

i. Cable Tunnel
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

j. Intermediate Building Clean Area (Emphasis: safeguard equipment, Auxiliary FW Pump Reservoir Area).
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ________________

k. Screenhouse
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ________________

l. Transformer Yard
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ________________

m. Equipment Hatch, Enclosed Area
Remarks, if desired:

Maint. Work Order & Trouble Report No. ________
(If Submitted)

n. Auxiliary Building, Including Intermediate Building Controlled Area (Emphasis: Safeguard Equipment, Fuel Storage Areas).
Remarks, if desired:

Maint. Work Order & Trouble Report No. ________
(If submitted)

o. Containment Building (When conditions permit).
Remarks, if desired:

Maint. Work Order & Trouble Report No. ________
(If submitted)

p. Laboratories
Remarks, if desired:

Maint. Work Order & Trouble Report No. ________
(If submitted)

q. Offices
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

r. Shops
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

s. Emergency Survey Center

NOTE: Obtain key for Emergency Survey Center from the Health Physics Office

Verify operation of VHF radio by performing a radio check. ____________
Initial

Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

t. Unusual Circumstances
Remarks, if desired:

Maint. Work Order & Trouble Report No.
(If submitted) ____________

3.4 During the random backshift or weekend assessment of operations, the Duty Engineer should assess crew manning and performance, equipment status and plant conditions.

3.4.1 The assessment of operations should include, but not be limited to, the following:

a) Perform the channel checks on the DAILY SURVEILLANCE CHECK sheet excluding Chemistry, Computer and Heat Balance checks.

Date____________________ Time__________________

Remarks, if desired:

b) Document by name, position and license the operating crew.

NAME	POSITION	LICENSE SRO	RO	NONE
	Shift Foreman			
	Shift Tech. Adv.			
	Head Control Op.			
	Control Operator			
	Aux. Operator			
	Aux. Operator			
	Aux. Operator			
	Aux. Operator			

c) Document major plant activities during random assessment.

d) Write assessment of shift performance.

Shift Performance Assessment

Acceptable______________________ Not Acceptable__________________

(If not acceptable, explain):

3.5 Adherance to Ginna Station Holding Rules.

3.5.1 Randomly select one Hold from the Station Hold Log or one Hold Card in place on equipment and verify proper documentation.

Locater Number ______________________

Hold Card(s) Properly Placed Yes ________ No __________

Remarks (if required) ______________________________________

____

____

3.6 Date Completed: ____________________

Completed By: ____________________

FORWARD TO PLANT SUPERINTENDENT

3.7 Technical Specification requirement 6.5.1.6 f states:

"The PORC shall be responsible for Review of facility operations to detect potential safety hazards," the Plant Superintendent shall present this report to the Plant Operations Review Committee to comply with the above Technical Specification.

Presented at PORC Meeting No. ______________

Date Completed : ______________

Plant Superintendent: ______________

FORWARD TO NEXT DUTY ENGINEER

3.8 The next duty engineer shall review the report for items that should be re-inspected.

Duty Engineer: ____________________

Date Reviewed: ____________________

Forwarded to Central Records On: ____________________
Date

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. A-201 REV. NO. 4

GINNA STATION ADMINISTRATIVE AND ENGINEERING STAFF RESPONSIBILITIES

Q.A. REVIEW

C R Anderson 2/20/80

TECHNICAL REVIEW

PORC 2/11/80

TRSchuler 2-25-80

QC REVIEW DATE

APPROVED FOR USE

[signature] 3-5-80

PLANT SUPERINTENDENT DATE

QA x NON-QA ______ CATEGORY 1.0

REVIEWED BY: ______________________

THIS PROCEDURE CONTAINS 33 PAGES

ADMINISTRATIVE PROCEDURE A-201

GINNA STATION ADMINISTRATIVE AND ENGINEERING STAFF RESPONSIBILITIES

1.0 PURPOSE:

1.1 This procedure outlines Ginna Station Administrative and Engineering Staff Responsibilities as required by Technical Specifications.

1.2 This procedure describes the staff responsibility for implementation of the requirements of the Ginna Station Quality Assurance Manual.

2.0 REFERENCES:

2.1 ANSI 18.7

2.2 Ginna Station Technical Specifications, Section 6

2.3 10 CFR 50.54

2.4 Ginna Station QA Manual, Section 2

2.5 Administrative Procedure A-203

2.6 Administrative Procedure A-303

2.7 Administrative Procedure A-502

2.8 Administrative Procedure A-202

3.0 INSTRUCTIONS:

3.1 Administrative Responsibilities

3.1.1 The plant staff reporting organization shall be as shown in Appendix A.

3.1.2 The plant staff general responsibility shall be defined as shown in Appendix B and Reference 2.8.

3.1.3 All plant staff are responsible to report to higher supervision any deviations from plant Technical Specifications.

3.1.4 All plant staff are to act in a responsible manner to assure a safe operating plant.

3.1.5 All cases of overlapping responsibilities as defined in Appendix B, and Reference 2.8, will be determined by the Plant Superintendent.

3.1.6 All plant staff have individual responsibilities for their own staff disciplines and are responsible to the Assistant Superintendent.

NOTE: All plant personnel are to report to higher supervision any deviations from Plant Technical Specifications or normal operations.

3.1.7 The Duty Engineer is delegated responsibility for plant operations and maintenance during off hours.

3.1.8 The Operations Engineer or his designate will be responsible for all orders concerning operations on a short term basis.

3.1.9 Special assignnment for any staff member for indefinate time periods may be assigned by the Plant Superintendent.

3.1.9.1 Replacements for special staff assignments may or may not be made as determined by the Plant Superintendent except as defined by Technical Specification Fig. 6.2.2.

3.1.9.2 For Special Tests (ST) or Station Modifications (SM) the Plant Superintendent may assign a staff individual as a Cognizant Engineer. For Station Modifications, the Cognizant Engineer may fulfill the job responsibilities similar to those of the Project Liaison Engineer as described in Reference 2.5 (A-203). For Special Tests, the Cognizant Engineer is responsible for preparation of a Safety Analysis in accordance with Reference 2.6 (A-303), preparation of Special Test procedures in accordance with Reference 2.7 (A-502), and coordination of the test performance.

3.2 Succession to the Superintendent's responsibility:

3.2.1 In accordance with Technical Specification, Section 6.1.1, which requires the Superintendent to delegate in writing the succession to this responsibility during his absence;

3.2.1.1 The Assistant Superintendent shall be responsible for over all facility operation in the absence of the Superintendent.

3.2.1.2 The Operations Engineer shall be responsible for over all facility operation, in the absence of the Superintendent and the Assistant Superintendent.

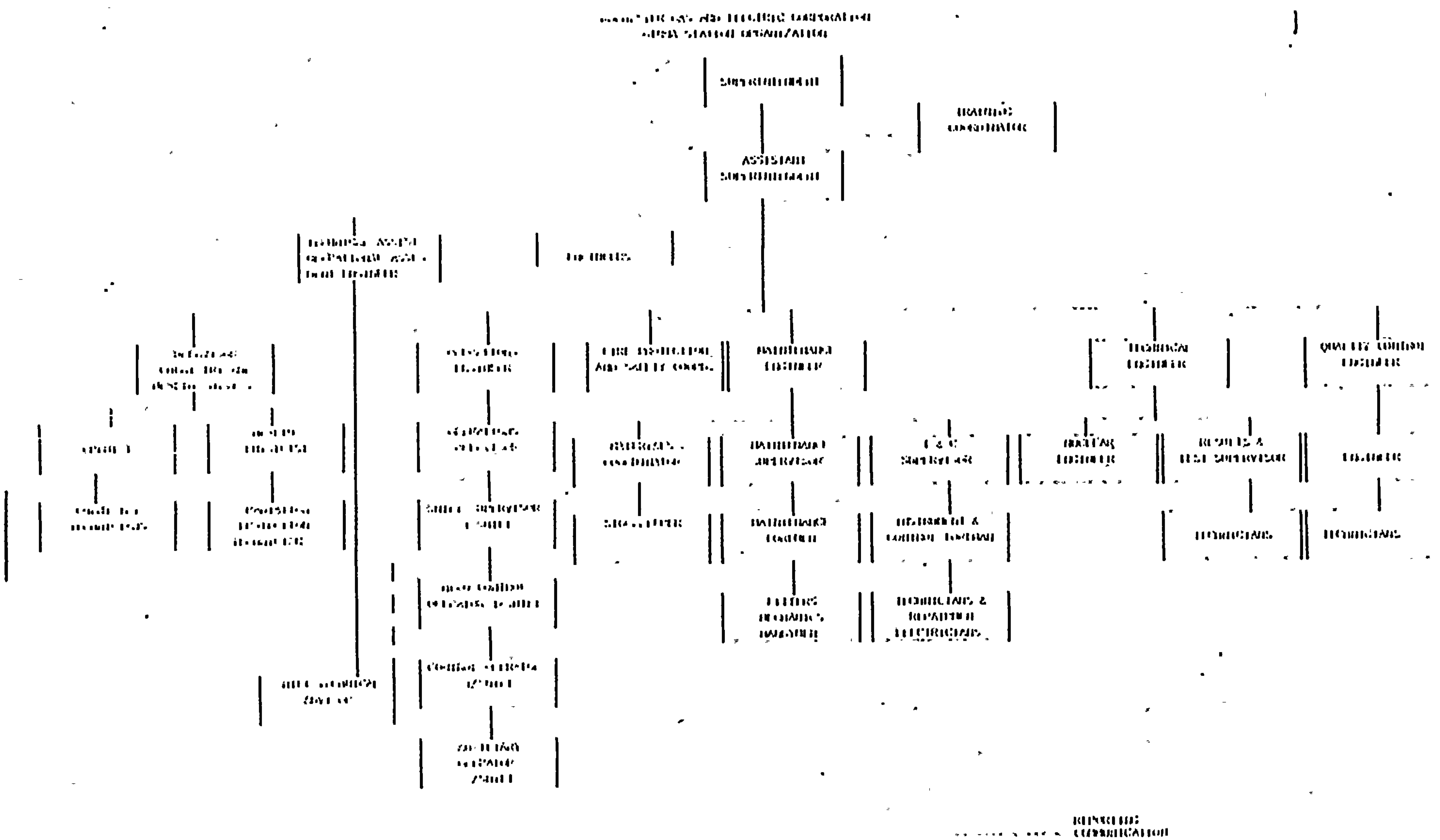
3.2.2 In cases where Administrative Procedures <u>specify</u>, the Assistant Superintendent may act simultaneously with the authority of Superintendent.

Examples of this type are: a - Property pass removal authority
b - Visitor entrance authority

3.2.3 In the absence of the Superintendent, the Operations Engineer may act as specified in 3.2.2 above.

4.0 <u>RECORDS</u>:

4.1 None


SUPERINTENDENT
TRAINING COORDINATOR
ASSISTANT SUPERINTENDENT
FIRE PROTECTION AND SAFETY COORD.
STOREKEEPER
MAINTENANCE ENGINEER
MAINTENANCE SUPERVISOR
MAINTENANCE FOREMAN
I & C SUPERVISOR
INSTRUMENT & CONTROL FOREMAN
TECHNICIANS & REPAIRMEN ELECTRICIANS
TECHNICAL ENGINEER
REACTOR ENGINEER
RESULTS & TEST SUPERVISOR
TECHNICIANS
QUALITY CONTROL ENGINEER
ENGINEER
TECHNICIANS
REPORTING
COMMUNICATION

A-201:3

APPENDIX B

GINNA STATION

SUPERINTENDENT

ACCOUNTABLE TO SUPERINTENDENT NUCLEAR PRODUCTION

I. GENERAL JOB FUNCTION DESCRIPTION:

To administer and direct the overall operations of Ginna Station in the production of electricity.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Administering and directing overall functions of Ginna Station to include power generation, operation, maintenance and responsibility for implementation of the Quality Assurance Program at Ginna Station.

*2. Testing and inspecting of all Plant equipment and systems including tests required by the N.R.C. and other agencies.

*3. Developing and carrying out of all safety and security policies and procedures designed to protect the employees, the public and the environment under any emergency condition.

*4. Formulating, applying, enforcing and maintaining all standards, procedures and records necessary to comply with N.R.C. and other governmental policies and regulations.

*5. Coordinating of all station activities and functions with other Company Departments.

*6. Administering and coordinating work of contractors and consultants involved in addition to maintaining a variety of contacts with contractors, consultants, etc.

*7. Ordering the immediate trip or shutdown of the Reactor.

*8. Ordering the initiation of emergency plans and deployment of Plant personnel for other emergencies as required.

*9. Responsible for the training and testing of all Plant personnel including the N.R.C. reactor operating licensing program.

*10. Evaluates and/or directs the evaluation of all Ginna Station functions and makes recommendations to superiors concerning the operational requirements of the Station.

*11. Classify station originated modifications.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

ASSISTANT SUPERINTENDENT

ACCOUNTABLE TO PLANT SUPERINTENDENT

I. GENERAL JOB FUNCTION DESCRIPTION:

Assist the Plant Superintendent with the administering and directing the overall operations of Ginna Station.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

Assist the Plant Superintendent by:

1. Administering the overall functions of Ginna Station.

*2. Testing of all Plant equipment and systems as required by the NRC and other Governmental Agnecies.

*3. Enforce all safety and security policies and procedures.

*4. Developing and Inspecting of all Standards, Procedures and records as required by NRC and other agencies.

5. Coordinate all Station activities and functions with other Company Departments.

*6. Coordination of all records, progress and technical reports and other documentation.

7. Direct and coordinate overall schedule planning.

*8. Administrate routine NRC Inspections and administrative requirements of the Tech. Specs.

9. Coordinate and maintain the work of contractors and consultants as required.

*10. Assume, in the absence of the Plant Superintendent, overall authority as defined by the Plant Superintendents position.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

TRAINING COORDINATOR

ACCOUNTABLE TO SUPERINTENDENT

I. GENERAL JOB FUNCTION DESCRIPTION:

The primary function of the Training Coordinator is to direct and administer the following training programs for personnel at Ginna Station: Administrative Controls; Health Physics Orientation; System Familiarization; Auxiliary Operator Qualification; N.R.C. Licensing Training; and Operator Requalification. The Training Coordinator reports directly to the Plant Superintendent. When absent, the Assistant Training Coordinator assumes the responsibilities of the Training Coordinator.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Preparing, scheduling and presenting classroom lectures for operating and staff personnel, emphasizing the safe and prudent methods of reactor Plant operation.

*2. Determining the specific information to be presented during classroom lectures for initial training and requalification.

*3. Carrying out the Company policy of operator training to maintain a high level of competence among operating personnel.

*4. Writing system descriptions for reactor plant training manuals.

5. Preparing reports on the status of training for Plant Superintendent and Superintendent of Nuclear Production.

*6. Preparing and presenting familiarization lectures for new personnel.

*7. Instructing temporarily assigned personnel in administrative controls, security, health physics and safety.

*8. Administer the training, preparation and auditing of emergency drills.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

OPERATIONS ENGINEER

ACCOUNTABLE TO ASSISTANT SUPERINTENDENT

I. GENERAL JOB FUNCTION DESCRIPTION:

The Operations Engineer reports directly to the Assistant Superintendent and is responsible and has authority for insuring the safe and efficient operation of the Plant, in accordance with applicable station licenses, operating procedures, emergency operating procedures, technical specifications and safety rules.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Establishing operator's work schedules, procedures and standards to implement the safe and efficient operation of the Plant.

*2. Maintaining, reviewing and evaluating operating records to preserve documentation of all operations, activities and Plant responses to any unusual conditions in compliance with N.R.C. Operating License Plant Technical Specifications.

*3. Assisting in the formal operating license training and requalification programs.

4. Coordinating operations with activities conducted by the Supervisor of Chemistry and Health Physics, Maintenance, Nuclear and Results and Test Engineers.

*5. Directing the operations of the reactor and turbine plant during startups, loading and unloading, shutdowns, refueling, radioactive waste, handling and testing.

*6. Directing activities concerning procedure document control, i.e., written procedure review and preparation and inventory needed in Operations.

*7. Checking and analyzing regularly the operations of the Plant and operating personnel, including computer data logger printouts, Plant logs, completed procedures and recorder chart traces to review recent operations and their effects on the various Plant parameters.

*8. Originating items and maintaining Plant Operating Procedures.

*9. Describing design changes or additions in Plant Systems layout for more effective, efficient and safe operations.

*10. Acting in behalf of the Plant and Assistant Plant Superintendent when assigned, particularly during off shift, weekend and holiday duty.

*11. Prescribing employee rules of conduct and establishing operating safety standards.

*12. Preparing accident, monthly and reportable occurrence reports on operations of Plant.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

OPERATIONS SUPERVISOR

ACCOUNTABLE TO OPERATIONS ENGINEER

I. GENERAL JOB FUNCTION DESCRIPTION:

Provide a comprehensive day by day review of Plant activities to preclude possible Tech. Spec. violations. Also provide for the early detection of Plant problems and establish proper planning of operational activities on a short term basis.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Review of Shift Supervisor's Log for compliance with A-20, for possible Tech. Spec. violation & proper documentation.

*2. Review of Official Records for compliance with A-20, proper documentation of Operational activities.

*3. Review of trouble cards for possible Tech. Spec. reporting and to expedite items to ensure Plant Operation.

*4. Review procedure change requests & Bypass of Safety Function and Jumper Control Requests.

*5. Review completed procedures & Station Hold Book.

*6. Review of operational activities as follows: Observation of Plant activities and Plant inspections.

*7. Review of Plant Parameters to detect long term trends and potential problems.

*8. Review of Log Sheets before they are sent to Central Records.

*9. Review of Gas Decay Tank, Waste Holdup Tank inventory.

*10. Review RCS Leakage Surveillance Records & Surveillance Schedules.

*11. Short Term Planning, such as, Waste Evaporator Startup, Boric Acid Evaporator Startup, Gas Decay Tank Release, Unit Startups & shutdowns.

*12. Performs routine duties of the Operations Engineer, in his absence, except where not permissable as guided by Regulations and Procedures which specifically require Operations Engineer Authority.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

SHIFT SUPERVISOR

ACCOUNTABLE TO OPERATIONS SUPERVISOR

I. GENERAL JOB FUNCTION DESCRIPTION:

The primary function of the Shift Supervisor is to supervise the operation and related activities of a pressurized water nuclear power plant to supply the electrical demand of the customer in the most efficient manner possible and to protect the health, safety and welfare of the general public from the potential hazards concurrent with a nuclear power plant. The Shift Supervisor reports directly to the Operations Engineer.

NOTE: The term "Shift Foreman" is interchangeable with "Shift Supervisor" in all Station documents and Station procedures.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Overseeing the steady state operations of the entire facility and directing the load variations.

*2. Ensuring the various functions and parameters of Ginna Station are maintained within the limits of the Technical Specifications.

*3. Directing the startup and heatup of the primary systems, reactor criticality and the escalation of power of the remainder of the facility.

*4. Directing the shutdown and cooldown of the entire facility.

*5. Overseeing the reactor operators and auxiliary operators in the performance of their duties.

*6. Ensuring proper operator relief and shift turnover and informing the incoming shift of the Plant status.

*7. Being aware of all completed procedures, unusual conditions, ongoing procedures, scheduled activities, temporary changes to procedure, etc. prior to accepting the shift.

8. Following Operations Standing Orders (OSO) and Operations Plan (OP), notifying the Operations Engineer of any requested alterations to the (OP) or referring to him any outdated or outmoded OSO's.

*9. Directing or advising subordinates in corrective actions following annunciator alarms.

*10. Reviewing and examining flux and thermocouple maps, operating procedures and logs to ensure safe operations and proper procedures for handling equipment.

*11. Calculating radioactive release rates for liquids and gases in addition to the thermal output of the reactor.

*12. Investigating all reactor trips and checking all available recording charts, log books and computer printouts.

*13. Checking all nuclear instrument channels, process instrumentation and radiation monitors to ensure proper operation and response to signals for reactor trip and control functions.

*14. Ensuring that all radiological safety rules and procedures are followed and that all personnel are properly instructed in radiation protection.

*15. Being responsible of personal radiation exposure and notifying any unusual radiation incidents or procedure changes to the Health Physicist.

*16. Ensuring that proper procedures are utilized and completed for applicable maintenance jobs and authorizing entry to high radiation and other restricted areas.

*17. Maintaining proficiency and knowledge of all phases of plant operation, including emergency procedures, refueling procedures, maintaining a complete inventory of tools and other equipment, training procedures and record keeping and maintaining an awareness of all nuclear regulatory agencies, acts, groups, societies, etc.

*18. Evaluating all emergency requests or reports from individuals to the immediate or subsequent actions dependent upon the nature of the incident and assessing the sifnificance of the condition.

*19. Being responsible for the safe operation of the Plant to prevent an act of industrial sabotage that could be threatening to the health and safety of the public.

*20. Maintaining a constant awareness of emergency action to be taken in the event of adversities resulting from natural causes.

*21. Being responsible to perform proper actions required to limit operation or shutdown plant due to unusual or abnormal operating conditions.

*22. Reporting all security violations, operational malfunctions and emergencies to Plant Superintendent and other authorized personnel.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

MAINTENANCE ENGINEER

ACCOUNTABLE TO ASSISTANT SUPERINTENDENT

I. GENERAL JOB FUNCTION DESCRIPTION:

The Maintenance Engineer reports directly to the Assistant Plant Superintendent and is responsible for the proper maintenance of all Plant components, equipment, instruments and buildings.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Coordinating all maintenance activities at Ginna Station performed by all Company Departments and contractors.

*2. Determining procedural controls needed and verifying adherence to these controls.

*3. Writing, reviewing and revising all maintenance procedures and verifying that all necessary maintenance history and quality control documentation are attached.

*4. Establishing maintenance work and equipment maintenance schedules.

*5. Reviewing equipment and maintenance histories for determining spare parts needs and maintenance frequencies.

*6. Analyzing operating information to detect equipment degradation.

7. Assisting and directing maintenance shops in trouble-shooting system abnormalities.

*8. Coordinating the development of the annual preventive maintenance schedules.

9. Establishing optimum work schedules and manpower levels to minimize outage times and expedite the return of the Unit to service.

10. Reviewing and approving all material and service receipts for Ginna Station in addition to supplying contact on critical material orders.

11. Attending SRO retraining lectures and PORC meetings.

*12. Act for and in the absence of the Plant and Assistant Plant Superintendent when assigned to the weekly "On Call" duty.

13. Plans station annual inspection and overhaul work involving Plant maintenance and coordinates these activities with operational activities.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

MAINTENANCE SUPERVISOR

ACCOUNTABLE TO MAINTENANCE ENGINEER

I. GENERAL JOB FUNCTION DESCRIPTION:

Responsible for the proper maintenance of all Plant components, equipment, instruments, and buildings.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Coordinate maintenance activities performed by Company Departments and contractors. Evaluate special jobs for safety hazards.

*2. Expedite locating critical materials and equipment.

*3. Initiate Quality Controlled material purchases.

4. Initiate Maintenance Department material purchases, assign proper account numbers.

*5. Establish work and equipment maintenance schedules.

*6. Review equipment maintenance histories and failure reports.

7. Establish spare parts inventory requirements.

8. Carry out duties of Plant Maintenance Engineer in his absence.

9. Act on behalf of Plant Superintendent and Assistant Superintendent on weekends and during off hours when assigned to special projects.

10. Supervise the following areas: Maintenance, Steamfitters, Welders, Electricians, Mechanics.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

STEAM FITTER FOREMAN

ACCOUNTABLE TO MAINTENANCE SUPERVISOR

I. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Directs the work of and supervises Steam Fitters in the installation, inspection, adjustment, and repair of a variety of piping and fluid carry equipment in the Station including pipes, tubing, hoses, valves and fittings, safety valves, separators, regulators, tanks, condensers, evaporators, attemperizers, heat exchangers, and other equipment containing steam, water, air, vapors, gases, oils, chemicals, and sewage.

*2. Is responsible for the installation, inspection, adjustments, and repair of fluid carrying components and equipment pertaining to boilers, turbines, generators, and their auxiliary equipment including feedwater pumps, cooling water pumps, air heaters, fans, fuel oil burning equipment, lubrication oil systems, air compressors, and other related and associated equipment.

*3. Is responsible for the installation, inspection, adjustment, and repair of fluid carrying components and equipment pertaining to station auxiliary systems including chlorinators, demineralizers, fresh and service water, plant sewage and drainage, and other related systems.

4. Is responsible for material requests for the ordering of necessary parts to maintain an adequate supply of parts under his jurisdiction.

5. Is responsible for making r ecommendations concerning the tenure and preference in employment of employees under his supervision and may be required to make periodic ratings of each employee.

6. Is responsible for the neatness and appearance of his work area.

*7. Upon occasion or in an emergency may assist authorized persons in making special tests and inspections.

8. Upon occasion or in an emergency assists in the repairs to any of the equipment in the Station in connection with other Station personnel.

9. Upon occasion or in an emergency, under closer supervision, performs more responsible duties as required.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED.

GINNA STATION

MECHANIC FOREMAN

ACCOUNTABLE TO MAINTENANCE SUPERVISOR

I. LISTING OF DUTIES: (SEE NOTE)

1. Directs the work of and supervises Mechanics and other employees under his jurisdiction.

*2. Is responsible for the mechanical inspection, repair, lubrication, and maintenance of equipment such as pumps, fans, turbines, air compressors, and other machinery under his jurisdiction or as directed. Plans this work and sees that it is done in accordance with correct procedures.

3. Is responsible for all material requisitions necessary to maintain an adequate stock of repair parts for equipment and tools under his jurisdiction.

*4. Supervises the operation of, or operates lathes, planers, drill presses, milling machines and other general machine shop equipment.

*5. Is responsible for the alignment of motors and steam equipment and balancing of rotating equipment.

6. Prepares work reports and records as required or directed.

7. Is responsible for making recommendations concerning the tenure and preference in employment of employees under his supervision and may be required to make periodic ratings of each employee.

8. Upon occasion or in an emergency may assume the responsibility of making major inspections and supervision of repairs on large turbines or water wheels.

9. Upon occasion or in an emergency, under closer supervision, performs more responsible duties as required.

10. Upon occasion or in an emergency performs other related or less skilled work as required or directed.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

SUBSTATION ELECTRICIAN FOREMAN

ACCOUNTABLE TO MAINTENANCE SUPERVISOR

I. LISTING OF DUTIES: .(SEE NOTE)

*1. Works with, directs the work of, and supervises a group of station maintenance men engaged in construction and maintenance of all types of dead or energized conductors, structures and equipment employed in the production and distribution of electrical energy in stations, substations or on the customer's premises, such as: installing, removing, or repairing generators, motors, rectifiers, batteries, transformers, regulators, reactors, reclosers, circuit breakers, capacitors, disconnecting switches, instruments, relays, lightning arrester, lighting equipment, conduit, grounding systems, and other allied equipment with control apparatus.

*2. Is responsible for the testing and inspecting of generators, motors, transformers, regulators, circuit breakers, reclosers, lightning arresters, control cables, power cables, insulating oil, and control apparatus, welding machines, MOV's, batteries.

3. Performs high tension switching as directed.

4. Prepares work reports and records as required or directed, writes procedures.

5. Requisitions material as required.

6. Is responsible for making recommendations concerning the tenure and performance in employment of employees under his supervision and is required to make periodic ratings of each employee.

7. Is responsible for neatness and appearance of his work area.

8. Upon occasion or in an emergency operates automotive equipment. (Cranes)

9. Upon occasion or in an emergency, under closer supervision, performs more responsible duties as required.

10. Performs other related or less skilled work as required or directed, upon occasion or in an emergency.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED.

GINNA STATION

INSTRUMENT AND CONTROL SUPERVISOR

ACCOUNTABLE TO MAINTENANCE ENGINEER

I. GENERAL JOB FUNCTION DESCRIPTION:

General Supervision of Instrument and Control Group to provide technical guidance for maintenance calibration, testing and upgrading (when required) of all installed Instrumentation and Control Systems associated with the Nuclear Reactor, its Auxiliary Systems and Conventional Steam portion of the Plant.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Scheduling, supervising instrument maintenance and calibration to insure maximum degree of reliability and availability of Plant.

*2. To provide technical guidance for maintenance, testing and provide assistance for calibration of Plant Radiation Monitoring System.

*3. Review and evaluate results of routine, annual, special test and calibration of installed instrumentation to comply with Plant Technical Specifications. Either initiates action or makes recommendations to supervision.

*4. Review QA ordering for Plant instrumentation.

GINNA STATION

INSTRUMENT AND CONTROL FOREMAN

ACCOUNTABLE TO INSTRUMENT AND CONTROL SUPERVISOR

I. LISTING OF DUTIES: (SEE NOTE)

1. Directs the work of and supervises Instrument and Control Repairmen.

*2. Is responsible for the installation, maintenance, repair and calibration of all types of gas, air, steam, water, oil and chemical meters, gauges thermometers and related equipment.

*3. Is responsible for the installation, maintenance, repair and adjustment of all automatic controls and supervisory instruments concerned with the operation of steam generating equipment, steam turbines, generators, and all associated auxiliary equipment.

*4. On installations of new equipment is responsible for the planning, laying out of and installation of all tubing, piping and related wiring and connections between the instruments, panel board and related equipment.

5. Recommends the ordering of necessary parts to maintain an adequate supply.

*6. Is responsible for the operation and maintenance of shop test equipment.

7. Assists Station Engineers on all major test work.

8. Prepares all necessary reports such as daily time sheets, test and maintenance reports, etc.

9. Is responsible for making recommendations concerning the tenure and preference in employment of employees under his supervision and may be required to make periodic ratings of each employee.

10. Is responsible for the neatness and appearance of his work area.

11. Upon occasion or in an emergency assumes the responsibility of making major tests as directed.

12. Upon occasion or in an emergency assists in repairs to any of the equipment in the Station in conjunction with other station personnel.

13. Upon occasion or in an emergency, under closer supervision, performs more responsible duties as required.

14. In the absence of the I & C Supervisor, report directly to the Maintenance Engineer.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED.

GINNA STATION

MATERIALS COORDINATOR

ACCOUNTABLE TO MAINTENANCE ENGINEER

I. GENERAL JOB FUNCTION DESCRIPTION:

Responsible for operation of Stockroom. Stocking materials for general issue as well as tools. Stocking of spare parts.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

1. Order Spareparts & Storehouse supplies. Order tools and materials from vendors.

2. Process daily requisitions for spare parts. Forward reorder cards to Maintenance Engineer.

*3. Receive Q.A. deliveries, check and forward papers to responsible individual.

4. Contact Company Departments and vendors concerning items ordered and expedite delivery.

*5. Be certain spare parts are stored properly and inventoried periodically.

*6. Expedite flow of deliveries to proper persons after being certain there are no descrepancies with carriers.

*7. Check power tools, rigging materials for any faults that could result in injuries.

8. Provide assistance to Property Records Department, fire inspectors, Safety Department.

9. New items - spare parts - cards to be prepared, listing in spare parts books, information to people who use same.

10. See that a clean and safe working area is maintained.

11. Supervise the Stockroom and Stockroom personnel.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

TECHNICAL ENGINEER

ACCOUNTABLE TO ASSISTANT SUPERINTENDENT

I.:RAL JOB FUNCTION DESCRIPTION:

technical engineer reports directly to the Assistant Superintendent is responsible for the Technical Department which included the .ear, Results and Test, Mechanical/Electrical Engineering and ıuter Sections.

IΙ.IFIC LISTING OF DUTIES: (SEE NOTE)

Direct professional - technical activities at Ginna Station performed by technical department personnel and contractors.

Directs station modifications and the design associated with minor modifications as described in Q.A. Manual.

Responsible for preparation review and approval of minor modification design documents, installation documents, and safety analyses.

Classifies, with Engineering, station originated modification whether major or minor.

Coordinates with Engineering the use of Engineering Specifications on minor modifications.

Directs Nuclear Plant Reliability Data for EEI, ANSI N 18-20 Committee.

Responsible for evaluation for 10 CFR 21 reporting requirements.

Plans station annual inspection and overhaul involving refueling, surveillance activities and modifications.

Attending SRO retraining lectures and PORC meetings.

Act for and in the absence of the Superintendent and Assistant Superintendent when assigned to the weekly "on-call" Duty Engineer.

Assuming specific assignment responsibilities as directed by the Assistant Superintendent - through Task Assignment, Engineering Work Requests.

Fire Protection Modifications - Ginna Station Fire Protection Task Force Manager.

Three Mile Island Incident Task Force Manager.

NOT) THOSE WHICH ARE NUCLEAR SAFETY RELATED.

GINNA STATION

RESULTS AND TEST SUPERVISOR

ACCOUNTABLE TO TECHNICAL ENGINEER

I. GENERAL JOB FUNCTION DESCRIPTION:

Responsibility for ensuring that all Technical Specifications Surveillance items pertaining to safety related equipment and/or systems are adequately checked and tested in accordance with requirements and frequency as reflected in Plant Technical Specifications and QA Manual Appendices B, C.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Writing, scheduling and supervising the performance of all test pertaining to Plant safety related equipment and/or systems.

2. Writing, scheduling and supervising, as required, the performance of all test pertaining to Plant non-safety related equipment and/or systems.

*3. Ensure that all equipment test and checks are performed in accordance with proper requirments and frequency as reflected in the Plant Technical Specifications and QA Manual Appendices B and C.

*4. Review all Technical Specification Surveillance equipment tests for adequacy of results and proper documentation.

*5. Conducting, supervising and assisting in the performance of daily Plant inspections, annual and refueling surveillance tests and other periodic surveillance tests.

*6. Supervising the daily activity of the Results and Test Section.

*7. Submitting surveillance material for monthly "in house" reports and operational reports to the NRC.

*8. Writing special reports, as required, for "in house" submittal and reports for submittal to NRC.

*9. Discussing with other Plant personnel all aspects of Plant operation and initiating corrective action when applicable.

*10. Attending and participating in weekly scheduled Plant Operating Review Committee meetings and other PORC meetings as conditions dictate.

*11. Assuming specific job responsibilities as directed by the Technical Engineer.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

NUCLEAR ENGINEER

ACCOUNTABLE TO TECHNICAL ENGINEER

I. GENERAL JOB FUNCTION DESCRIPTION:

Insure safe and efficient operation of reactor.

III. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Maintains special nuclear material accountability, records, and procedures including reports pertaining to nuclear operation of plant refueling operation, physics testing and results, uranium and plutonium use and storage.

*2. Directs activities of primary system during refueling period including physics measurements and reactor evaluation measurement.

*3. Initiates and analyzes studies of fuel performance and evaluation.

*4. Evaluates core refueling configurations and rod replacements.

*5. Evaluates procedures & analysis of nuclear testing.

*6. Assists on writing operating orders which pertain to the nuclear characteristics of the core, methods of operation and emergency procedures.

*7. Reviews reactor core thermal performance and reactor stability, analyzes equipment malfunction, and suggests corrective action.

*8. Participates in the Senior Reactor Operators training.

9. Assuming specific job responsibilities as directed by the Technical Engineer.

10. Acts for and in the absence of the Plant and Assistant Superintendent when assigned to the weekly "on call" duty.

11. Writing special reports, as required for "in house" and operational reports to the NRC.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED.

GINNA STATION

SUPERVISOR OF CHEMISTRY & HEALTH PHYSICS

ACCOUNTABLE TO ASSISTANT PLANT SUPERINTENDENT

I. GENERAL JOB FUNCTION DESCRIPTION:

Supervise operation of Chemistry & Health Physics Labs, Health Physics activities, Water Treatment, Radioactive. Waste Disposal, and environmental surveillance.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Maintain a program of radiation protection for Plant personnel and other assigned workers.

*2. Direct the testing of various liquid & gaseous systems to assure compliance with operating & license requirements.

*3. Initiate tests & studies to determine trends and causes for changes in chemical or radiological status of the plant.

*4. Maintain supplies for operating the chemical and radiation protection program.

*5. Maintain records of all chemical & radiochemical aspects of the Plant.

*6. Prepare reports for NRC, NSARB & Management relative to waste releases, chemistry & radiation exposure.

*7. Control the release of solid, liquid & gaseous radioactive wastes so as to meet license requirements.

8. Determine trends & advance in radiation protection and chemical technology.

9. Direct a program of environmental surveillance to detect any changes allied to the plant.

*10. Control the operation of systems. & work schedules for the safety of Plant personnel and the general public.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

SECONDARY CHEMIST

ACCOUNTABLE TO SUPERVISOR OF CHEMISTRY & HEALTH PHYSICS

I. GENERAL JOB FUNCTION DESCRIPTION:

The main function of this position is to oversee the chemical control of all non-radioactive systems at the Plant site. This includes both the environmental systems, such as Plant Waste and Circulating Water Systems; the Plant Systems, such as Feedwater, Makeup Water and Steam Generator Water Systems.

II. SPECIFIC LISTING OF DUTIES:

1. It is the secondary chemist's responsibility to choose and set up the methods used for analysis by his technicians.

2. He must check the work and accuracy of all analysis, to insure proper chemical control.

3. Interprets the results of the various test and to instruct operations of changes that may be needed.

4. Has responsibility to check the accuracy of the various continuous monitors and to instruct operations in the use of the data from these monitors.

*5. Works on special radiochemical procedures and helps out when needed on both environmental and primary chemical problems.

*6. During shutdown periods, the secondary chemist assists as a Health Physicist. His responsibilities then are generally to help oversee the in-plant aspects of Health Physics. This includes evaluating jobs for radiation and health hazards and writing the work permits for a job.

*7. He also helps to insure that proper samples and surveys are performed to protect the workers. At times he is put in charge of special projects, such as, the Steam Generator inspection and repair. In this case, he has responsibility for all Health Physics aspects of the job.

*8. The secondary chemist is in charge of ordering laboratory, health physics, and plant chemical supplies.

*9. In the absence of the Supervisor of Chemistry and Health Physics, he may assume authority of the Supervisor of Chemistry and Health Physics.

*10. Assisting in the training of radiation protection personnel.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

HEALTH PHYSICIST

ACCOUNTABLE TO SUPERVISOR OF CHEMISTRY & HEALTH PHYSICS

I. GENERAL JOB FUNCTION DESCRIPTION:

The prime function of the Health Physicist is to establish procedures, methods and standards necessary to carry out radiation monitoring programs, coordinate activities of the Health Physics group with those of other Plant groups, conducts investigations, inspections, surveys and tests to insure compliance with Federal, State, and Company regulations on personnel radiation exposure, radioactive concentrations in plant systems, and radiation and radioactivity levels in the plant. The Health Physicist normally reports directly to the Supervisor of Chemistry and Health Physics, however, he also has direct communication with the Plant Superintendent.

II. SPECIFIC LISTING OF DUTIES (SEE NOTE)

*1. Directing and conducting radiation monitoring and training programs to prevent unwarranted radiation exposure to Plant personnel and the environment.

*2. Reviewing all personnel internal and external radiation exposure data. Preparing and reviewing reports to PORC, NRC and individuals.

*3. Initiating radiation work procedures to provide proper protective clothing, personal radiation measuring devices, survey information, and laying out monitoring procedures for special radiation jobs.

*4. Reviewing all Plant instruments as they relate to radiation and radioactivity levels in addition to investigating and determining causes of any anomalies.

*5. Reviewing radiation and contamination survey data and ensuring that radiation areas are properly posted or barricaded, decontaminated or shielded to acceptable levels.

*6. Authorizing and restricting personnel from entry to radiation areas as necessary to maintain exposure limits.

7. Prepare procedures for handling and shipping solid waste and oversee their operation.

*8. In the absence of the Supervisor of Chemistry and Health Physics, he may assume authority of the Supervisor of Chemistry and Health Physics.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED.

* 9. Evaluating radiological conditions and advising Plant Superintendent during radiation emergencies.

*10. Approving release rates for radioactive liquid and gaseous effluents.

*11. Assisting in the training in radiation protection for personnel.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

RADIO-CHEMIST

ACCOUNTABLE TO SUPERVISOR OF CHEMISTRY AND HEALTH PHYSICS

I. GENERAL JOB FUNCTION DESCRIPTION

The function of this position is to oversee the chemical analysis of all systems which contain radioactive materials or have the potential of being radioactive. This includes primary and auxiliary systems, wastes and environmental samples. He will work closely with the Secondary Chemist whenever needed and with the Health Physicist when he requires analyses.

II. SPECIFIC LISTING OF DUTIES

*1. Review radiochemical data on reactor coolant system, related auxiliary systems, and liquid or gaseous waste systems.

*2. Establish methods and procedures for radiochemical determinations on liquids and gases and develop methods for other analysis on radioactive samples.

*3. Provide procedures and review the calibration and use of laboratory radioactivity counting and measuring instruments.

*4. Prepare procedures and review analyses of environmental samples. Prepare reports of waste releases and environmental surveys.

*5. Determine release rates and approve releases of radioactive liquids and gases.

*6. Assist in training of radiation protection personnel.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

QUALITY CONTROL ENGINEER

ACCOUNTABLE TO ASSISTANT PLANT SUPERINTENDENT

I. GENERAL JOB FUNCTION DESCRIPTION:

Implementation of the RG&E Quality Assurance Program at Ginna Station in accordance with the requirements of the Ginna Station Quality Assurance Manual and Appendices.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

*1. Training of staff and QC Group in QA/QC practices and policies.

*2. Review of procedures and changes thereto.

*3. Coordinating changes to administrative procedures involving changes to the Ginna Station Quality Assurance Manual and Appendices.

*4. Directs preparation and controls processing of Quality Control Inspection Procedures (QCIP's).

*5. Establishing quality requirements through review of Procurement document Preparation for QA services, materials or equipment.

*6. Perform Supplier Qualification Technical Evaluations for calibration and inspection services.

*7. Performing final material receipt acceptance of all QA material received, including nuclear fuel.

*8. Controlling start of work activities involved in station modifications and performing final inspections and document reviews of installed modification prior to acceptance for use.

*9. Coordinating the assignment of NDE personnel needed at Ginna Station and compiling of NDE Repots following examinations.

*10. Directing the implementation of the QC inspection and surveillance program at Ginna, to include establishing inspection requirements in minor modification design packages, plant procedures, assignment of qualified inpection personnel and review of results.

*11. Training Certification of QC Inspection and Surveillance Personnel.

*12. Directing the implementation of the Ginna Station Inservice Inspection Program as prescribed through Appendix B of the Ginna Station QA Manual.

*13. Coordinate control and calibration of mechanical measuring tools.

*14. Coordinate processing of nonconformance reports and control nonconforming materials.

*15. Prompt reporting to the Superintendent and following of all reported significant conditions adverse to Quality and the coordination of subsequent Corrective Action Reports.

*16. Review of NRC correspondence for initiation of corrective action or preventive action.

*17. Direct the establishment and implementation of a records storage and control system, and document control of engineering flow diagrams, elementary wiring diagrams and cable termination sheets.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

OFFICE SUPERVISOR

ACCOUNTABLE TO ASSISTANT SUPERINTENDENT

I. GENERAL JOB FUNCTION DESCRIPTION:

The primary function of the Office Supervisor is to supervise, direct and coordinate the administration of the Ginna Station General Office.

II. SPECIFIC LISTING OF DUTIES:

1. Supervising and directing the General Office staff in all aspects of Ginna Station office procedures.

*2. Supervising Central Records Staff.

3. Evaluating all office functions and initiating changes where necessary.

4. Compiling information for Plant staff to aid in figuring lead time for material and manpower requirement for shutdown.

5. Planning work assignments and objectives for office personnel in order to meet special deadlines.

6. Coordinating office functions to support other departments.

7. Scheduling licensed personnel for required N.R.C. physical examination.

8. Is responsible for petty cash disbursements and reimbursements.

9. Reviewing and auditing time reports and pay records.

NOTE: STAR (*) THOSE WHICH ARE NUCLEAR SAFETY RELATED

GINNA STATION

SHIFT TECHNICAL ADVISER

ACCOUNTABLE TO TECHNICAL ASSISTANT - OPERATIONAL ASSESSMENT ENGINEER

I. GENERAL JOB JUNCTION DESCRIPTION:

The Shift Technical Adviser improves the capability to respond to off-normal plant conditions by augmenting the accident assessment capability by rapidly being available in the Control Room in case of an accident to aid in recognizing and reacting to many unusual situations such as: Multiple equipment failures, operating errors, transient responses, inadequate core cooling and by focusing on vital plant parameters.

II. SPECIFIC LISTING OF DUTIES: (SEE NOTE)

A. SAFETY MONITORING FUNCTIONS:

*1. During off-normal conditions, the Shift Technical Advisor will be functioning in the accident assessment function.

*2. Will be detached from the manipulation of controls and immediate supervision of operators.

*3. Will be functioning in an advisory capacity to the Shift Supervisor.

*4. Readily available in the Control Room at all times (< 10 minutes).

*5. Provide both perspective in assessment of Plant condition and dedication to safety of the Plant.

*6. Recognize and react to any unusual situation (multiple equipment failures and operator errors, complex transient responses, inadequate core cooling, focus on essential parameters).

B. OPERATIONAL EXPERIENCE ASSESSMENT FUNCTION:

*1. During normal Plant conditions, the Shift Technical Adviser will perform the operational experience assessment function.

*2. Maintains and upgrades safe Plant operation.

*3. Is cognizant of and evaluates applicable operating experience such as:
   - Licensee Event Reports (LER) from similar plant design
   - NRC IE Bulletins, Notices and Circulars
   - Emergency Procedures
   - Westinghouse Circulars
   - Nuclear Plant Reliability Data (NPRD)

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER Y

PROCEDURE NO. 0-6.13 REV. NO. 3

DAILY SURVEILLANCE LOG

TECHNICAL REVIEW

PORC 1/7/80

TRSchuler
QC REVIEW

1-11-80
DATE

APPROVED FOR USE

[signature]
PLANT SUPERINTENDENT

1-11-80
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 11 PAGES

0-6.13

DAILY SURVEILLANCE LOG

1.0 PURPOSE:

1.1 To provide guidance to the Control Room Operators for performing daily checks.

1.2 To provide a checklist for review by oncoming and offgoing control room operators and shift supervisors of critical plant parameters to assure that they are within allowable limits.

2.0 REFERENCES:

2.1 Technical Specification Section 1 & 3

2.2 NUREG 0578 TMI-2 Lessons Learned Task Force Report (Short Term)

2.3 September 13, 1979 letter from Darrell G. Eisenhut on Followup Actions Resulting from the NRC Staff Reviews Regarding the Three Mile Island Unit 2 Accident.

2.4 October 30, 1979 letter from Harold R. Denton on Discussion of TMI Lessons Learned Short-Term Requirements.

3.0 INITIAL CONDITIONS:

3.1 Any operational or shutdown mode.

4.0 PRECAUTIONS:

4.1 Submit trouble card or other documentation as necessary for any abnormalities noted.

5.0 INSTRUCTIONS:

5.1 Perform channel checks on each shift, per Tech. Spec. 1.7.1, as listed on Attachment I. Signifiy this check by initialing appropriate space. Items that are not appropriate for current operational mode may be marked N/A.

5.2 Verify other parameters as listed are operable, performed or within Technical Specification limits on day or shift as appropriate.

5.3 For shift relief turnover purposes prior to the end of each shift, a check of parameters on Attachment I will be performed.

5.4 For values not in normal range for current operating mode, initiate an A-25.1 Ginna Station Event Report.

5.5 The parameter check will be reviewed and signed by offgoing Control Room Operators, Shift Supervisor, and Shift Technical Advisor.

5.6 The parameter check will be reviewed and signed by the oncoming Control Room Operators, Shift Supervisor and Shift Technical Advisor.

5.7 Verify that the following breaker switch positions:

5.7.1 The 1A and 1B Containment Spray Pumps breaker switches in automatic position.

5.7.2 The 1A, 1B, 1C Safety Injection pump breaker switches in automatic position.

5.7.3 The 1A, 1B, 1C and 1D Containment recirculation fan breaker switches in automatic position.

5.7.4 The 1A and 1B RHR pump breaker switches in automatic position.

5.7.5 The 1A, 1B, 1C and 1D service water pump breaker switches in automatic position.

5.7.6 The 1A and 1B auxiliary feed pump breaker switches in automatic position.

5.7.7 Turbine Driven Aux. FW Pump steam valves 1A and 1B breaker switches in Auto Position (during hot shutdown, as needed).

5.8 Verify the following on the Diesel Generator (D/G) board for the 1A and 1B D/G's.

5.8.1 The Emergency D/G air start solenoids indicating lights ASV-1, and ASV-2 are lit.

5.8.2 The Emergency D/G start relay (R-1 and R-2) indicating lights are lit.

5.8.3 The Emergency D/G Man-Auto Switch is to the auto position.

5.8.4 The Emergency D/G Unit-Parallel switch is to the unit position.

5.8.5 The Emergency D/G Start Circuit Breaker Control Switches in Auto position.

5.8.6 The C & D Standby Auxiliary Feedwater Pump Breaker Switches are in Neutral Position.

5.9 Color coded markings have been located near selected valve position indicators. The markings are coded generally as follows:

GREEN marking over green indicating light if valve is to be in the closed position during normal at-power or hot shutdown operation.

RED marking over red indicating light if valve is in the open position during normal at-power or hot shutdown operation.

Verify the status by comparing the markings with the valve indicating lights to assure the following:

5.9.1	Standby Aux. Feedwater Valves:	
5.9.1.1	Recirc. Valves	MOV-9710A closed
		MOV-9710B closed
5.9.1.2	Discharge valves	MOV-9701A open
		MOV-9701B open
5.9.1.3	Cross-over Valves	9703A closed
		9703B closed
5.9.1.4	Isolation Valves	9704A open
		9704B open
5.9.1.5	Suction Valves	9629A closed
		9629B closed
5.9.2	Excess letdown Loop A cold leg	AOV 310 closed
5.9.2.1	Charging valve regenerative heat exchanger.	AOV 392A closed
5.9.3	Letdown orifice regenerative heat exchanger.	AOV 200A closed
5.9.4	RHR pump suction from Loop A Hot Leg	MOV 701 closed
5.9.5	RHR pump discharge to Loop B Cold Leg	MOV 720 closed
5.9.6	Make-up water to RCP A standpipe	AOV 550A closed
5.9.7	RCP 1A seal discharge	AOV 270A open
5.9.8	Excess letdown Hx diversion seal Hx or Drain Tank	AOV 312 Normal
5.9.9	Alternate Charging Valve Loop A Cold Leg	AOV 392B Closed
5.9.10	Letdown orifice regenerative Heat Exchanger to non-regenative heat exchanger.	AOV 200B Open
5.9.11	RHR pump suction from Loop A Hot Leg.	MOV 700 Closed
5.9.12	RHR pump discharge to Loop B Cold Leg.	MOV 721 Closed
5.9.13	Make-up water to PZR relief tank.	AOV 548 Closed
5.9.14	RCP Seal by-pass valve.	AOV 386 Closed
5.9.15	Emergency borate valve.	MOV 350 Closed
5.9.16	Charging valve regenerative heat exchanger to Loop B Cold Leg.	AOV 294 Open

5.9.17	Letdown orifice regenerative heat exchanger.	AOV 202 Closed
5.9.18	Component cooling to RHR heat exchanger.	MOV 738A Closed
5.9.19	Component cooling to RHR heat exchanger.	MOV 738B Closed
5.9.20	Make-up water to RCP B stand pipe.	AOV 550B Closed
5.9.21	RCP 1B seal discharge.	AOV 270B Open
5.9.22	Auxiliary spray valve regenerative heat exchanger to pressurizer.	AOV 296 Closed
5.9.23	Volume control tank vent valve.	258 Closed
5.9.24	Deborating demineralizer valve.	AOV 244 Closed
5.9.25	Component cooling from RCP 1A thermal barrier.	AOV 754A Open
5.9.26	Component Cooling from RCP 1B thermal barrier.	AOV 754B Open
5.9.27	Component Cooling from excess letdown heat exchanger isolation valve.	AOV 745 Open
5.9.28	Make-up water to component cooling surge tank.	MOV 823 Closed
5.9.29	Component cooling surge tank vent.	RCV 017 Open
5.9.30	RHR pump discharge to reactor vessel deluge.	MOV 852A Closed
5.9.31	1B SI Accumulator Discharge to Loop A.	MOV 865 Open
5.9.32	1A SI Accumulator discharge to Loop B.	MOV 841 Open
5.9.33	SI pump 1C discharge to Loop B.	MOV 871A Open
5.9.34	SI pump 1C discharge to Loop A.	MOV 871B Open
5.9.35	Containment spray pump 1A discharge valve.	MOV 860A Closed
5.9.36	Containment spray pump 1A discharge valve.	MOV 860B Closed
5.9.37	Containment spray pump 1B discharge valve.	MOV 860C Closed
5.9.38	Containment spray pump 1B discharge valve	MOV 860D Closed
5.9.39	Component cooling to containment isolation valve.	MOV 817 Open
5.9.40	Component cooling to support coolers isolation valve.	MOV 813 Open
5.9.41	Component cooling from support coolers isolation valve.	MOV 814 Open

5.9.42	RHR pump discharge to reactor vessel deluge.	MOV 852B Closed
5.9.43	SI discharge to Loop B Hot Leg.	MOV 878A Closed
5.9.44	SI discharge to Loop B Cold Leg.	MOV 878B Open
5.9.45	SI discharge to Loop A Hot Leg.	MOV 878C Closed
5.9.46	SI discharge to Loop A Cold Leg.	MOV 878D Open
5.9.47	Make-up control boron to blender.	AOV 110A Open/Auto
5.9.48	Make-up control blender to charging pump.	AOV 110B Closed/Auto
5.9.49	Make-up control blender to volume control tank.	AOV 110C Closed/Auto
5.9.50	Make-up control water to blender.	AOV 111 Closed/Auto
5.9.51	Containment air out isolation.	AOV 1597 Open
5.9.52	Containment air out isolation.	AOV 1598 Open
5.9.53	Component cooling to RCP 1A isolation.	MOV 749A Open
5.9.54	Component cooling to RCP1B isolation.	MOV 749B Open
5.9.55	SI pump suction from BA tanks.	MOV 826A Open
5.9.56	SI pump suction from BA tank.	MOV 826B Closed
5.9.57	SI pump suction from BA tanks.	MOV 826C Open
5.9.58	SI pump suction from BA tanks.	MOV 826D Closed
5.9.59	Containment Spray Charcoal filter douse.	MOV 875A Closed
5.9.60	Containment spray charcoal filter douse.	MOV 875B Closed
5.9.61	Containment spray charcoal filter douse.	MOV 876A Closed
5.9.62	Containment spray charcoal filter douse.	MOV 876B Closed
5.9.63	1A RHR pump suction.	MOV 704A Open
5.9.64	1B RHR pump suction.	MOV 704B Open
5.9.65	Component cooling from RCP 1A isolation valve.	MOV 759A Open
5.9.66	Component cooling from RCP 1B isolation valve.	MOV 759B Open
5.9.67	RCDT pump suct from sump B.	1813A Closed
5.9.68	RCDT pump suct from sump B.	1813B Closed
5.9.69	SI pump recirc to RWST.	AOV 897 Open

5.9.70	RHR pump suction from cont sump B.	MOV 850A Closed
5.9.71	RHR pump suction from cont sump B.	MOV 850B Closed
5.9.72	RHR pump suction from RWST.	MOV 856 Open
5.9.73	RWST storage tank outlet.	MOV 896A Open
5.9.74	RWST storage tank outlet.	MOV 896B Open
5.9.75	Valve 896A key switch.	OFF
5.9.76	1C SI pump suction.	MOV 1815A Open
5.9.77	1C SI pump suction.	MOV 1815B Open
5.9.78	Seal or excess letdown.	MOV 313 Open
5.9.79	Letdown isol. valve regenerative to non-regenerative.	AOV 371 Open
5.9.80	SI pump suction from RWST.	MOV 825A Closed
5.9.81	SI pump suction from RWST.	MOV 825B Closed
5.9.82	SI pump recirc. to RWST.	AOV 898 Open
5.9.83	RHR pump suction from cont. sump B.	MOV 851A Open
5.9.84	RHR pump suction from cont. sump B.	MOV 851B Open
5.9.85	RHR pump discharge to SI pump suction.	MOV 857A Closed
5.9.86	RHR pump discharge to SI pump suction.	MOV 857B Closed
5.9.87	RHR pump discharge to SI pump suction.	MOV 857C Closed
5.9.88	Valve 896B key switch.	OFF
5.9.89	Valve 852A key switch.	OFF
5.9.90	Valve 852B key switch.	OFF
5.9.91	Containment spray NaOH addition.	AOV 836A Normal Closed Auto
5.9.92	Residual heat removal heat exchanger RC outlet.	HCV 624 Open
5.9.93	Residual heat removal heat exchanger out.	HCV 625 Open
5.9.94	Residual heat removal Loop RC return.	HCV 626 Closed Manual

5.9.95	Containment spray NaOH addition.	AOV 836B Normal Closed Auto
5.9.96	Safety Inject Block/Normal Switch	Normal Position
5.9.97	Aux. S/G FW Pump 1A and 1B & Turbine Driven FW Pump during power operation. (During hot shutdown, as needed).	
5.9.97.1	Discharge valves	MOV 3996 Open MOV 4007 Auto MOV 4008
5.9.97.2	SW Suction Valves	MOV 4027 Closed MOV 4028 MOV 4013
5.9.97.3	Aux. FW Cross-tie valves	MOV 4000A Closed MOV 4000B Normal
5.9.97.4	Aux. FW Bypass Switches	1-A Normal 1-B Normal

Refer to 0-6.13
for Instructions

DATE: ______________

DAILY SURVEILLANCE LOG

ATTACHMENT I

Parameter checklist: Alarm values and T.S. Limits given for information.

PARAMETER		ALARM VALUE	T.S. LIMIT	0001 - 0800	0801 - 1600	1601 - 2400
RMS, Process Monitor Containment atmos. isolated	R-11 part.	3×10^5 cpm				
	R-12 gas	3 x 10[illegible] cpm				
Containment releasing to atmos/purging	R-11 part.	5 x 10[illegible] cpm (for part, W/T ½ > 8d)				
	R-12 gas	4 x 10[illegible] cpm (X-133)				
	R-10A iodine	1 fan; incr. 1600 cpm in 1 hr. 2 fans; incr. 2600 cpm in 1 hr.				
Plant atmos.	R-13 part.	1 x 10[illegible] cpm	2.8 x 10[illegible] cpm			
	R-14 gas	1.1 x 10[illegible] cpm	1.1 x 10[illegible] cpm			
	R-10B Iodine	computer incr. 100 cpm in ½ hr.				
Liquid release	R-18	B.G + 6×10^4 cpm	B.G. + 6 x 10[illegible] cpm with 1 circ. pump on			
RMS, Area Monitor Incore area	R-7	100 mr/hr				
Charging pump room	R-4	100 mr/hr				
Reactor Coolant Flow Loops A & B		Low 90%	Reactor Trip 90%			
R.W.S.T. *	Maintain > 69%	Low 31% Lo-Lo 10%	230,000 gal.			
S.I. Accumulator	* 1A/1B Level	Hi 75% Low 57%	82% 50%			
	* 1A/1B Press.	Hi 760 psig. Low 720 psig.	700			
Containment Pressure (cc)	Cs	30 psig				
	M.S. Isolation	20 psig				
	SI high	6 psig				
	High Deviation	2.5 psig	3 psig			
	Low Deviation	-1.5 psig	-2 psig			
Boric Acid Tank Levels	* 1A1/1A2 1B1/1B2	High 75% Low 25% Lo-Lo 10%	56% for 1 tank 28% for 2 tanks			
Temps.		High 175°F Low 155°F	145°F			

Refer to 0-6.13
for Instructions

DAILY SURVEILLANCE LOG (Cont'd)

PARAMETER	ALARM VALUE	T.S. LIMIT	0001 - 0800	0801 - 1600	1601 - 2400
Heat Tracing System (Trouble Report from Aux. Oper.)	140°F				
Spray Additive Tank Level * Maintain > 89%	Low 40%	85%			
Pressurizer Pressure (cc)	High 2310 Low 2185 SI 1715	S.L. 2735 psig S.V. 2485 Reactor Trip High 2385 PORV open 2335 Reactor Trip Low 1865			
Pressurizer Level (cc)	Reactor trip: 87%, Hi 70% Level deviation from program ± 5% Lo-Lo heater cutout Low 10.6%	92%			
Reactor Coolant Tavg. Loop (cc) A & B	Hi 578°F Low 543°F With SI for MS iso 543°F With TT for FW iso 554°F Deviation rod stop ± 4°F				
Overtemp. Diff. Temp (cc) (Delta T SP1)	Rod Stop at FP approx. 62°F	Trip at FP ~ 64°F			
Overpower Diff. Temp (cc) (Delta T SP2)	Rod Stop at FP approx. 60°F	Trip at FP ~ 62°F			
Control Rod Alignment	± 7.5"	± 15"			
NIS Power Range (cc)	Hi range trip 108% Hi range rod stop 103% Low range trip 24%	109% 25%			
Intermediate Range (cc)	trip high 25% equiv. Rod Stop: 20% equiv.				
NIS PWR Range Chan. Dev.	± 2% Flux Dev.	Power Reduction option > 1.02 < 1.12 shutdown ≥ 1.12			
Source Range (cc)	Reactor trip 10^5 cps Hi flux at shutdown 2 X shutdown countrate				
Steam Generator Water Level (cc) A & B	High Level iso. 68% deviation ± 7% from program Single Channel Trip Low 30% Reactor Trip Lo-Lo 16%	5%			
Steam Line Pressure - Loop (cc) A & B	low 600 psig SI lo-lo 500 psig				

Refer to 0-6.13
for Instructions

DAILY SURVEILLANCE LOG (Cont'd)

PARAMETER	ALARM VALUE	T.S. LIMIT	0001 - 0800	0801 - 1600	1601 - 2400
Turbine 1st Stage Pressure (cc)					
Primary System Leakage (Evaluate)					
Power Range Heat Balance (0-6.3)					
Core Quadrant Power Tilt (0-6.4)			N/A		N/A
Boron Follow Samples Entered **					
Boron Follow Time 0 Set **					
Computer Program Check (S-26.1)					
Diesel Fuel Supply (> 5,3000 Tk Ind.) ** A/B ______/______			N/A		N/A
Reactor Coolant System Cl $\leq$ .15 ppm **	______ ppm				
Reactor Coolant System 02 $\leq$ .10 ppm **	______ ppb				
Fluoride $\leq$ .15 ppm **	______ ppm				
Reactor Coolant System $\leq$ 84/E µCi/gm **	______ µCi/gm				
Breaker Switch Position Verified as per step 5.7					
Diesel Generator Status Verified as per step 5.8					
Valve Position Satus Verified as per step 5.9					

* Record parameter each shift

** Only on day or shift applicable - N/A rest of time

(cc) Channel Check

Refer to 0-6.13
for Instructions

DAILY SURVEILLANCE LOG (Cont'd)

	0001 - 0800	0801 - 1600	1601 - 2400
Offgoing Control Operator	________	________	________
Offgoing Head Control Operator	________	________	________
Offgoing Shift Supervisor	________	________	________
Offgoing Shift Technical Advisor	________	________	________

	0801 - 1600	1601 - 2400	0001 - 0800
Oncoming Shift Supervisor	________	________	________
Oncoming Head Control Operator	________	________	________
Oncoming Control Operator	________	________	________
Oncoming Shift Technical Advisor	________	________	________

QA - NON-PERMANENT - DISPOSITION DATE ________ RECORD CATEGORY A-2.h

RECEIVED CENTRAL RECORDS ________

OPERATIONS REVIEW ________

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 1

PROCEDURE NO. 0-9 REV. NO. 0

SHIFT RELIEF TURNOVER - CONTROL ROOM

TECHNICAL REVIEW

PORC 3/10/80

TRSchuler
QC REVIEW

3-24-80
DATE

APPROVED FOR USE

for [signature]
PLANT SUPERINTENDENT

3-25-80
DATE

QA X NON-QA ___ CATEGORY 1.0

REVIEWED BY: ______________________

THIS PROCEDURE CONTAINS 4 PAGES

0-9

SHIFT RELIEF TURNOVER - CONTROL ROOM

1.0 PURPOSE:

1.1 To provide an aid to awareness of plant conditions at the time of shift change.

1.2 To formalize review of control board general status to assure proper configuration of controls and systems.

1.3 To provide for identification of vital safety parameters and equipment deserving particular attention during shift turnover.

2.0 REFERENCES:

2.1 Regulatory Guide 1.33

2.2 Regulatory Guide 1.114

2.3 NUREG 0578 TMI-2 Lessons Learned Task Force Report (Short Term)

2.4 September 13, 1979 Letter from Darrell G. Eisenhut of Followup Actions Resulting from the NRC Staff Reviews Regarding the Three Mile Island Unit 2 Accident

2.5 October 30, 1979 Letter from Harold R. Denton on Discussion of TMI Lessons Learned Short-Term Requirements

3.0 INITIAL CONDITIONS:

3.1 None

4.0 PRECAUTIONS:

4.1 None

5.0 INSTRUCTIONS:

5.1 Each outgoing Shift Operator shall inform the relief of the plant status as related to the scope of work involved, discussing any continuing procedures, unusual conditions and scheduled operating activities.

5.2 The offgoing Control Room Operators and Shift Supervisor (SS) will review the 0-6.13 Daily Surveillance Log.

5.3 The offgoing Shift Supervisor shall review the following matters (NA if no entry applicable) with the offgoing Control Room Operators and then the oncoming Shift Supervisor. The oncoming SS review with the oncoming Control Room Operators. Document on Attachment I.

5.3.1 Jumper wires installed (See Log).

5.3.2 Trouble Reports submitted.

5.3.3 Equipment and systems Out of Service (OOS).

5.3.3.1 Hold Book.

5.3.3.2 Review of reports for A-52.4, Control of Limiting Conditions for Operating Equipment.

5.3.3.3 Review of reports for A-52.5, Control of Limiting Conditions for System Specifications.

5.3.4 Operational activities which have occurred on the previous shift.

5.3.5 Continuing procedures, i.e., waste evaporator operation, plant cooldown, etc.

5.3.6 Scheduled operational activities.

5.3.7 Unusual conditions.

5.3.7.1 Review of A-25.1 Ginna Station Event Reports.

5.3.7.2 Review of temporary changes in procedures.

5.4 The offgoing Shift Supervisor and the Control Room Operators shall signify their completion of the above on Attachment I and turn over to the oncoming personnel.

5.5 The oncoming Control Room Operators and Shift Supervisor shall review the above.

5.6 The oncoming Shift Supervisor, after accepting the shift, shall review 0-6.13, Daily Surveillance Log, and turn it over to the oncoming Control Room Operator.

5.7 The oncoming Shift Supervisor, should, at the earliest convenience, attend to the following:

5.7.1 Review the Shift Supervisor's Log since his last time on shift or as necessary to update knowledge with recent activities.

5.7.2 Ensure continuing procedures are progressing satisfactorily.

5.7.3 Commence scheduled activities pertaining to the shift. Assign Fire Brigade Captain and communicate with the auxiliary operators and H.P. as needed.

5.7.4 Review and sign SWP's as needed.

5.8 Auxiliary Operators shall review their activities with their reliefs in accordance with Procedure 0-9.1.

5.9 Duty Health Physics Technicians shall review their activities with their reliefs in accordance with Procedure A-52.1.4.

Refer to 0-9
for Instructions

ATTACHMENT I

SHIFT RELIEF TURNOVER - CONTROL ROOM

5.3 The offgoing S.S. review the following with the offgoing C.R. operators and the oncoming S.S. The oncoming S.S. review with the oncoming C.R. operators.

		0000 - 0800		0800 - 1600		1600 - 2400	
		Offgoing	Oncoming	Offgoing	Oncoming	Offgoing	Oncoming
5.3.1	Jumper wires installed						
5.3.2	Trouble Reports Submitted						
5.3.3	Equipment/Systems OOS						
5.3.3.1	Hold Book						
5.3.3.2	A-52.4						
5.3.3.3	A-52.5						
5.3.4	Operational Activities Completed						
5.3.5	Continuing Activities						
5.3.6	Scheduled Activities						
5.3.7	Unusual Conditions						
5.3.7.1	A-25.1						
5.3.7.2	Temporary PCN						

Additional Comments:

Refer to 0-9
for Instructions

ATTACHMENT I (Cont'd)

The above list has been reviewed:

	0000 - 0800	0800 - 1600	1600 - 2400
Offgoing Control Operator	________	________	________
Offgoing Head Control Operator	________	________	________
Offgoing Shift Supervisor	________	________	________
Offgoing Shift Technical Advisor	________	________	________

	0801 - 1600	1601 - 2400	0001 - 0800
Oncoming Shift Supervisor	________	________	________
Oncoming Head Control Operator	________	________	________
Oncoming Control Operator	________	________	________
Oncoming Shift Technical Advisor	________	________	________

Reviewed By: ____________________ Category 1.0

GINNA STATION
UNIT #1
COMPLETED
DATE :-
TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. 0-9.1 REV. NO. 1

SHIFT RELIEF TURNOVER - AUXILIARY OPERATOR

TECHNICAL REVIEW

PORC 3-27-80

TRSchuler
QC REVIEW

3-27-80
DATE

APPROVED FOR USE

JCNoon
PLANT SUPERINTENDENT
Fq

3-27-80
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 3 PAGES

0-9.1

SHIFT RELIEF TURNOVER - AUXILIARY OPERATOR

1.0 PURPOSE:

1.1 To provide a method for offgoing and oncoming Auxiliary Operators to transfer information regarding plant conditions.

2.0 REFERENCES:

2.1 NUREG 0578 TMI-2 Lessons Learned Task Force Report (Short Term)

2.2 September 13, 1979 Letter from Darrell G. Eisenhut on followup actions resulting from the NRC Staff Reviews Regarding the TMI-2 Accident

2.3 October 30, 1979 Letter from Harold R. Denton on Discussion of TMI Lessons Learned Short Term Requirements

2.4 Technical Specifications, Section 3

3.0 INITIAL CONDITIONS:

3.1 None

4.0 PRECAUTIONS:

4.1 None

5.0 INSTRUCTIONS:

5.1 Attachment I checklist shall be completed each shift by the offgoing Auxiliary Operators and reviewed by the oncoming auxiliary operators.

5.1.1 If part of the system is determined inoperable, record component and reason for inoperability.

5.2 The checklist must be current at the time of shift turnover.

5.3 The completed checklist and operating logs shall be reviewed by all on-coming relief auxiliary operators.

5.4 The plant systems shall be checked to determine if any components are under maintenance or test conditions.

5.5 Systems and components shall be considered operable and in acceptable status by visual or audio inspection or by breaker indications.

5.6 If system is not required to be operable while plant is in cold shutdown, the step may be marked N/A.

Refer to 0-9.1
for Instructions

ATTACHMENT I

SHIFT RELIEF TURNOVER - AUXILIARY OPERATORS

All components operable; if NO, list problems per step 5.1.1

5.1 SYSTEM	0000 - 0800	0800 - 1600	1600 - 2400
Safety Injection	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
CVCS	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Containment Spray	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Condensate & Feedwater	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Auxiliary Feedwater	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Standby Auxiliary Feedwater	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Steam Generator Blowdown	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Main Steam	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
RHR	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
C.C. Water	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Service Water	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Fire Water	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Diesel Generator	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Instrument Air	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Spent Fuel Pit	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Waste Disposal	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___
Auxiliary Building Vent	YES___ NO___ NN___	YES___ NO___ NN___	YES___ NO___ NN___

* NN = NOT NEEDED

5.1.1 List problems with above:

Refer to 0-9.1
for Instructions

ATTACHMENT I (Cont'd)

	0001 - 0800	0801 - 1600	1601 - 2400
Offgoing Primary Operator			
Offgoing Secondary Operator			

	0801 - 1600	1601 - 2400	0001 - 0800
Oncoming Primary Operator			
Oncoming Secondary Operator			
Oncoming Additional Auxiliary Operators			

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

PROCEDURE NO. S-21.1 REV. NO. 0

S-21.1

1A HYDROGEN RECOMBINER PURGING AND OPERATION

TECHNICAL REVIEW

NON QA

PORC 3-31-75
DATE

TRSchuler
Q/C REVIEW

APR 5 1975
DATE

APPROVED FOR USE

CEPeters
PLANT SUPERINTENDENT

APR 5 1975
DATE

CONTROLLED DOCUMENT

NUMBER 4

S-21.1

1A HYDROGEN RECOMBINER PURGING AND OPERATION

1.0 PURPOSE:

1.1 To describe the steps necessary to purge air from the Recombiner System Hydrogen Piping.

1.2 To describe the steps necessary to operate the 1A Hydrogen Recombiner to maintain the hydrogen concentration in containment at a safe level.

2.0 REFERENCES:

2.1 ST 71-2.1, ST 71-2.2, ST 71-2.3, ST 71-2.4.

3.0 INITIAL CONDITIONS:

3.1 The waste disposal system hydrogen and nitrogen supply manifolds are operational. ________

3.2 Containment pressure is 5 psig or less. ________

3.3 Containment temperature is 155°F or less. ________

3.4 The hydrogen content of the containment atmosphere has been measured at least several times at intervals several hours apart. Results consistently demonstrate that there is no discernable trend for the hydrogen level to reach or exceed 4.1% by volume before the system can be placed in service. ________

3.5 At least two (2) containment recirculating fans are operating and have been operating continuously from the time sampling of the containment atmosphere started. ________

3.6 A supply of hydrogen is available on the hydrogen manifold with all bottle positions filled on both manifolds. ________

3.7 The containment oxygen concentration is 8% by volume or greater. ________

3.8 If oxygen must be made up to the containment, a supply must have been delivered to the site and attached to deliver to the gas to the system. ________

3.9 Communications have been established between the control room and the 1A hydrogen recombiner control panel. ________

4.0 PRECAUTIONS:

4.1 Only one (1) hydrogen recombiner should be in operation at any given time.

4.2 An operator must be stationed at the hydrogen recombiner control panel continuously while the recombiner is in operation.

4.3 Power to the hydrogen recombiner control panel must be present at all times. However, the key switch (SS12) admitting power to control circuits must be locked out except when the recombiner is to be operated. With the power switch off, power is still supplied to the motor space heaters.

5.0 INSTRUCTIONS:

5.1 Purging the 1A hydrogen recombiner system piping with nitrogen.

5.1.1 Check the following list of valves and switches to be sure they are in the normal startup position. ________

1A H_2 RECOMBINER PRE-PURGE SWITCH POSITION CHECKOFF

	Switch	Position	
1.	System test - SS1	Test	________
2.	Thermocouple Selector - SS2	TC-1 or TC-2	________ ________
3.	Exciter mode switch - SS3	Auto	________
4.	Exciter selector switch - SS4	No. 1 or No. 2	________ ________
5.	Pilot block & bleed valves - SS6	Auto	________
6.	Main H_2 block & bleed valves - SS7	Auto	________
7.	Oxygen isolation valves - SS9	Center	________
8.	H_2 Pilot isolation valve - SS10	Center	________
9.	H_2 Main Burner isolation valve - SS11	Center	________
10.	Sequence switch - SS13	Normal	________
11.	Control power - SS12	Off	________

1A HYDROGEN RECOMBINER PRE-PURGE VALVE CHECKOFF

Valve No.	NAME	Position
M-35	"A" Recombiner H_2 Shut-off.	open________
M-37	FT - 2A Isolation	open________

Valve No.	NAME	POSITION
M-38	FT - 2A Isolation	open______
M-39	FT - 2A Bypass	closed______
M-40	FT - 2A Vent	closed______
M-41	FT - 2A Vent	closed______
M-42	"A" Recombiner H_2 Supply Line Vent	closed______
M-43	"A" Recombiner H_2 Supply Line Vent	closed______
M-44	"A" Recombiner H_2 Supply Line Vent	closed______
M-45	PI - 5A and PI - 8A Shut-off	open______
M-46	PI - 13A Shut-off (supply)	open______
M-47	PI - 14A Shut-off (main fuel line)	open______
M-48	PI - 6A and PT - 2A Shut-off (main fuel line)	open______
M-49	PI - 15A Shut-off (pilot line)	open______
M-50	PI - 16A and PT - 9A Shut-off (pilot line)	open______
1A	Recombiner Dampers (in C.V.)	open______
1075A	"A" Recombiner Pilot Line Vent	closed______
1083A	"A" Recombiner Main Fuel Line Vent	closed______
1076A	"A" Recombiner Pilot Line Manual Containment Isolation Valve.	closed______
1084A	"A" Recombiner Main Fuel Line Manual Containment Isolation Valve.	closed______
M-51	"B" Recombiner H_2 Shut-off.	closed______

5.1.2 Insert the spool piece between the waste disposal hydrogen manifold (100 psig side) and the hydrogen recombiner fuel line. ______

5.1.3 Close the manual H_2 supply header isolation valve from the hydrogen recombiner supply line.

V-1082B closed______

5.1.4 Open N_2 supply valve to hydrogen recombiner supply line and regulate flow.

V-1082A open______

5.1.5 Obtain the keys to the 1A hydrogen recombiner panel. __________

5.1.6 Turn switch SS12 (control power) to "on" to put power in the control circuits of the recombiner. __________

5.1.7 Unlock and open 1A hydrogen recombiner pilot manual containment isolation valve.

V-1076A open__________

5.1.8 Unlock and open 1A hydrogen recombiner main fuel line manual containment isolation valve.

V-1084A open__________

5.1.9 Adjust PCV - 2 and PCV-3A so that gas pressure at PI-16A is 5 psi above containment pressure. __________

5.1.10 Place TRC-1A on manual control and stroke FCV-2A wide open. __________

5.1.11 Confirm by PI-6A that pressure in the main hydrogen line is 5 psi greater than containment pressure. __________

5.1.12 Clear the containment trip signal for isolation valves IV-3A and IV-5A and obtain permission from the main control room to open the valves. <u>DO NOT OPEN THE VALVES AT THIS TIME</u>. __________

5.1.13 Turn control board containment isolation switch for the 1A hydrogen recombiner to "open". __________

5.1.14 Open isolation valve IV-3A by placing switch SS-10 in the "open" position.

IV-3A open__________

5.1.15 Turn switch SS-6 to "manual" to open block valves BV-5A and BV-8A and close bleed valves BV-6A and BV-7A in the pilot line. __________

5.1.16 Check PI-16A to be sure pressure is above containment pressure. __________

5.1.17 Purge pilot line with nitrogen for five (5) minutes. __________

5.1.18 Return switch SS-6 to "auto" to close block valves BV-5A and BV-8A and open bleed valves BV-6A and BV-7A in the pilot line. __________

5.1.19 Close IV-3A by closing switch SS-10. IV-3A closed__________

5.1.20 Lock closed the 1A hydrogen recombiner pilot line manual containment isolation valve.

1076A closed__________

5.1.21 Unlock and open the 1A hydrogen recombiner main fuel line manual containment isolation valve.

1084A open__________

5.1.22 Turn switch SS-7 to manual to open block valves BV-9A and BV-12A and close bleed valves BV-10A and BV-11A in the main fuel line. ______

5.1.23 Stroke FCV-2A from TRC-1A to set pressure at P1-6A at 5 psi above containment pressure. ______

5.1.24 Open switch SS-11 to open isolation valve IV-5A. IV-5A open______

5.1.25 Purge the 1A hydrogen recombiner main fuel line with nitrogen for five (5) minutes. ______

5.1.26 Return switch SS-7 to "auto" to close block valves BV-9A and BV-12A and open bleed valves BV-10A and BV-11A in the main fuel line. ______

5.1.27 Close IV-5A by closing switch SS-11. IV-5A closed______

5.1.28 Return TRC-1A to "auto". ______

5.1.29 Lock closed the 1A hydrogen recombiner main fuel line manual containment isolation valve.
1084A closed______

5.1.30 Isolate the recombiner fuel line from the waste disposal nitrogen supply by closing valve 1082A.
V-1082A closed______

5.1.31 The hydrogen lines have been purged and the pressure in the piping exceeds atmospheric. Otherwise the purging process must be repeated. ______

5.2 1A Hydrogen Recombiner Operation

5.2.1 Verify the attached valve alignment checkoff and switch position checkoff. ______

<u>H_2 RECOMBINER PRE-OPERATIONAL SWITCH POSITION CHECKOFF</u>

Switch	Position	
1. System test - SS1	Run	______
2. Thermocouple selector - SS2	TC-1 or TC-2	______ ______
3. Exciter mode switch - SS3	Auto	______
4. Exciter selector switch - SS4	No. 1 or No. 2	______ ______
5. Pilot block & bleed valves - SS6	Auto	______
6. Main H_2 block & bleed valves - SS7	Auto	______

	Switch	Position
7.	Oxygen isolation valves - SS9	Center ________
8.	H_2 Pilot isolation valve - SS10	Center ________
9.	H_2 Main burner isolation valve - SS11	Center ________
10.	Sequence switch - SS13	Normal ________
11.	Control power - SS12	Off ________

1A HYDROGEN RECOMBINER PRE-OPERATIONAL VALVE CHECKOFF

Valve No.	NAME	POSITION
M-35	"A" Recombiner H_2 Shut-off.	open ________
M-37	FT - 2A Isolation	open ________
M-38	FT - 2A Isolation	open ________
M-39	FT - 2A Bypass	closed ________
M-40	FT - 2A Vent	closed ________
M-41	FT - 2A Vent	closed ________
M-42	"A" Recombiner H_2 Supply Line Vent	closed ________
M-43	"A" Recombiner H_2 Supply Line Vent	closed ________
M-44	"A" Recombiner H_2 Supply Line Vent	closed ________
M-45	PI-5A and PI-8A Shut-off.	open ________
M-46	PI-13A Shut-off (supply)	open ________
M-47	PI-14A Shut-off (main fuel line)	open ________
M-48	PI-6A and PT-2A Shut-off (main fuel line)	open ________
M-49	PI-15A Shut-off (pilot line)	open ________
M-50	PI-16A and PT-9A Shut-off (pilot line)	open ________
1A	Recombiner Dampers (in C.V.)	open ________
1075A	"A" Recombiner Pilot Line Vent	closed ________
1083A	"A" Recombiner Main Fuel Line Vent	closed ________
1076A	"A" Recombiner Pilot Line Manual Containment Isolation Valve.	closed ________
1084A	"A" Recombiner Main Fuel Line Manual Containment Isolation Valve.	closed ________
M-51	"B" Recombiner H_2 Shut-off	closed ________

1A HYDROGEN RECOMBINER PRE-OPERATIONAL VALVE CHECKOFF (CONT.)

OXYGEN SUPPLY LINE

VALVE NO.	NAME	POSITION
M-1	O_2 Filter Isolation	open__________
M-2	O_2 Filter Isolation	open__________
M-3	O_2 Filter Vent	closed__________
M-4	O_2 "A" Supply Line Isolation	closed__________
M-5	O_2 "B" Supply Line Isolation	closed__________
M-6	O_2 "A" Supply Line Vent	closed__________
M-7	O_2 "B" Supply Line Vent	closed__________
M-8	O_2 FT - 1A Isolation	open__________
M-9	O_2 FT - 1B Isolation	open__________
M-10	O_2 FT - 1A Isolation	open__________
M-11	O_2 FT - 1B Isolation	open__________
M-12	O_2 FT - 1A Bypass	closed__________
M-13	O_2 FT - 1B Bypass	closed__________
M-14	O_2 FT - 1A Vent	closed__________
M-15	O_2 FT - 1B Vent	closed__________
M-16	O_2 FT - 1A Vent	closed__________
M-17	O_2 FT - 1B Vent	closed__________
M-18	O_2 "A" Supply Line Vent	closed__________
M-19	O_2 "B" Supply Line Vent	closed__________
M-20	O_2 "A" Supply Filter Isolation	open__________
M-21	O_2 "B" Supply Filter Isolation	open__________
M-22	O_2 "A" Supply Filter Vent	closed__________
M-23	O_2 "B" Supply Filter Vent	closed__________
M-24	O_2 "A" Supply Filter Isolation	open__________

1A HYDROGEN RECOMBINER PRE-OPERATIONAL VALVE CHECK-OFF (CONT.)

OXYGEN SUPPLY LINE: (CONTINUED)

VALVE NO.	NAME	POSITION
M-25	O_2 "B" Supply Filter Isolation	open________
M-26	PI-2A and PT-7A Shut-off	open________
M-27	PI - 2B and PT-7B Shut-off	open________
M-28	PI-11A Shut-off	open________
M-29	PI-11B Shut-off	open________
M-30	PI-12A Shut-off	open________
M-31	PI-12B Shut-off	open________
M-32	PT-1A and PI-3A Shut-off	open________
M-33	PT-1B and PI-3B Shut-off	open________
M-34	PI-1 Shut-off	open________
1079	O_2 Supply Lines "A" and "B" Vent	closed________
1080A	O_2 Supply Manual Containment Isolation Valve	closed________

5.2.2 Select which pressure regulator PCV-1041 or PCV-1042 in the waste disposal system hydrogen supply manifold is going to be used.

PCV-1041________

or PCV-1042________

5.2.3 If using PCV-1041, isolate PCV-1042 by closing the inlet and outlet isolation valves.

V-1871 closed________

V-1872 closed________

5.2.4 If using PCV-1042, isolate PCV-1041 by closing the inlet and outlet isolation valves.

V-1873 closed________

V-1874 closed________

5.2.5 Open the Shut-off valve between the recombiner fuel line and the waste disposal hydrogen supply.

V-1082B open________

5.2.6 Unlock and open the manual containment isolation valve in the 1A hydrogen recombiner pilot line.

V-1075A open________

5.2.7 Unlock and open the manual containment isolation valve in the 1A hydrogen recombiner main fuel line.
V-1084A open__________

5.2.8 Turn switch SS-12 (control power) to "on" to put in the control circuits of the recombiner. __________

5.2.9 Confirm fuel line pressure exceeds containment pressure on PI-13A. __________

5.2.10 If the oxygen concentration in containment is less than 8% by volume perform the following steps. If oxygen enrichment is not necessary proceed to step 5.2.18. __________

5.2.11 Open the "A" oxygen supply line isolation valve. M-4 open__________

5.2.12 Confirm the "B" oxygen supply line isolation valve is closed.
M-5 closed__________

5.2.13 Unlock and open the oxygen supply manual containment isolation valve.
V-1080A open__________

5.2.14 Set ratio control RC-1 at desired ratio. __________

5.2.15 Open valving from truck to pressurize the oxygen line. __________

5.2.16 Confirm pressure at PI-2A is greater than containment pressure. __________

5.2.17 Obtain permission from the main control room to open IV-1A and IV-2A, but <u>DO NOT</u> open the valves now. __________

5.2.18 Select one of the two exciter circuits for operation by switch SS-4.
EX-#1__________
EX-#2__________

5.2.19 Confirm exciter mode switch SS-3 is in "auto". __________

5.2.20 Select the control thermocouple to be used by switch SS-2. TC-1__________
TC-2__________

5.2.21 Open 1A hydrogen recombiner pilot isolation valve, IV-3A, by switch SS-10, with permission from main control room.
IV-3A open__________

5.2.22 Open 1A hydrogen recombiner main fuel line isolation valve, IV-5A, by switch SS-11, with permission from main control room.
IV-5A open__________

5.2.23 Verify that the area near the 1A hydrogen recombiner is clear of all non-essential personnel. __________

5.2.24 Start the blower. ________

5.2.25 Set TRC-1A to control at 800°F. ________

5.2.26 When the "end of purge" light comes on, press "flame start" button. Ensure that TRC-1A is within 100°F of the temperature during the temperature increase. ________

5.2.27 Lightoff from this point to main burner ignition is automatically sequenced. When steady main burner lightoff is proved as indicated by a steady thermocouple readout, 800°F, bring the combustor temperature up to the desired operating temperature over a ten (10) minute period by adjusting TRC-1A in 100°F increments until 1400°F is reached. ________

5.2.28 If oxygen is to be added to containment perform the following steps. If enrichment is not necessary proceed to step 5.2.31. ________

5.2.29 Confirm "A" oxygen supply line pressure is above containment pressure at PI-3A. ________

5.2.30 Open the oxygen line containment isolation valves, IV-1A and IV-2A by switch SS-9.

IV-1A open________

IV-2A open________

5.2.31 When subsequent samples of the containment atmosphere indicate that the hydrogen concentration has been reduced to the desired level (below 2%) the system is to be shutdown. ________

5.2.32 Press the "flame-stop" button. ________

5.2.33 Confirm that the following have happened:

a) IV-3A and IV-5A closed. ________
b) BV-5A, BV-8A, BV-9A, BV-12A closed. ________
c) BV-6A, BV-7A, BV-10A, BV-11A open. ________
d) FR-1A No Flow. ________
e) TRC-1A is coasting down. ________

5.2.34 Close the oxygen line containment isolation valves IV-1A and IV-2A, by switch SS-9.

IV-1A closed________

IV-2A closed________

5.2.35 Lock closed the following manual containment isolation valves:

V-1076A	Pilot Line	closed________
V-1084A	Main Fuel Line	closed________
V-1080A	Oxygen Line	closed________

5.2.36 Turn off the blower when TRC-1A reaches 500°F. ______

5.2.37 Close the hydrogen and oxygen supply line shut-off valves.

M-35 closed______
M-4 closed______

5.2.38 Turn switch SS-12 to "off" to cut power to the panel control circuits. ______

5.2.39 Close the shut-off valve between the recombiner fuel line and the waste disposal hydrogen supply.

V-1082B closed______

5.2.40 Repeat system piping purge with nitrogen, step 5.1. ______

5.2.41 Remove spool piece between the waste disposal hydrogen manifold (100 psig side) and the hydrogen recombiner fuel line. ______

COMPLETED BY:______

DATE COMPLETED:______

SHIFT FOREMAN:______

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

PROCEDURE NO. S-21.2 REV. NO. 0

S-21.2

1B HYDROGEN RECOMBINER PURGING AND OPERATION

TECHNICAL REVIEW

NON QA

PORC 3-31-75
DATE

TRSchuler
Q/C REVIEW

APR 3 1975
DATE

APPROVED FOR USE

CEPlatt
PLANT SUPERINTENDENT

APR 3 1975
DATE

CONTROLLED DOCUMENT

NUMBER 4

S-21.2

1B HYDROGEN RECOMBINER PURGING AND OPERATION

1.0 PURPOSE:

1.1 To describe the steps necessary to purge air from the recombiner system hydrogen piping.

1.2 To describe the steps necessary to operate the 1B hydrogen recombiner to maintain the hydrogen concentration in containment at a safe level.

2.0 REFERENCES:

2.1 ST 71-2.1, ST 71-2.2, ST 71-2.3, ST 71-2.4.

3.0 INITIAL CONDITIONS:

3.1 The Waste Disposal Hydrogen and Nitrogen Supply Manifolds are operational. ________

3.2 Containment pressure is 5 psig or less. ________

3.3 Containment Temperature is 155°F or less. ________

3.4 The hydrogen content of the containment atmosphere has been measured several times at intervals several hours apart. Results consistently demonstrate that there is no discernable trend for the hydrogen level to reach or exceed 4.1% by volume before the system can be placed in service. ________

3.5 At least two (2) containment recirculating fans are operating and have been operating continuously from the time sampling of the containment atmosphere started. ________

3.6 A supply of hydrogen is available on the hydrogen manifold with all bottle positions filled on both manifolds. ________

3.7 The containment oxygen concentration is 8% by volume or greater. ________

3.8 If oxygen must be made up to the containment, a supply must have been delivered to the site and attached to deliver the gas to the system. ________

3.9 Communications have been established between the control room and the 1B hydrogen recombiner control panel. ________

4.0 PRECAUTIONS:

4.1 Only one (1) hydrogen recombiner should be in operation at any given time.

4.2 An operator must be stationed at the hydrogen recombiner control panel continuously while the recombiner is in operation.

4.3 Power to the hydrogen recombiner control panel must be present at all times. However, the key switch (SS 12) admitting power to control circuits must be locked out except when the recombiner is to be operated. With the power switch off, power is still supplied to the motor space heaters.

5.0 INSTRUCTIONS:

5.1 Purging the 1B Hydrogen Recombiner system piping with nitrogen.

5.1.1 Check the following list of valves and switches to be sure they are in the normal startup position. ________

1B H_2 RECOMBINER PRE-PURGE SWITCH POSITION CHECKOFF

	Switch	Position	
1.	System test - SS1	Test	________
2.	Thermocouple Selector - SS2	TC-1	________
		or TC-2	________
3.	Exciter mode switch - SS3	Auto	________
4.	Exciter Selector Switch - SS4	No. 1	________
		or No. 2	________
5.	Pilot Block & bleed valves - SS6	Auto	________
6.	Main H_2 Block and bleed valves - SS7	Auto	________
7.	Oxygen isolation valves - SS9	Center	________
8.	H_2 Pilot Isolation Valve - SS10	Center	________
9.	H_2 Main Burner Isolation Valve - SS11	Center	________
10.	Sequence Switch - SS13	Normal	________
11.	Control Power - SS12	Off	________

1B HYDROGEN RECOMBINER PRE-PURGE VALVE CHECKOFF

VALVE NO.	NAME	POSITION
M-51	"B" Recombiner H_2 Shut-off.	open________
M-54	FT - 2B Isolation	open________
M-55	FT - 2B Isolation	open________
M-56	FT - 2B Bypass	closed________

VALVE NO.	NAME	POSITION
M-57	FT - 2B Vent	closed_____
M-58	FT - 2B Vent	closed_____
M-52	"B" Recombiner H_2 Supply Line Vent	closed_____
M-53	"B" Recombiner H_2 Supply Line Vent	closed_____
M-59	"B" Recombiner H_2 Supply Line Vent	closed_____
M-60	PI-5B and PI-8B Shutoff	open_____
M-61	PI-13B Shut-off (supply)	open_____
M-62	PI-14B Shut-off (main fuel line)	open_____
M-63	PI-6B and PT-2B Shut-off (Main Fuel Line)	open_____
M-64	PI-15B Shut-off (Pilot Line)	open_____
M-65	PI-16B and PT-9B Shut-off (Pilot Line)	open_____
1B	Recombiner Dampers (in C.V.)	open_____
1075B	"B" Recombiner Pilot Line Vent	closed_____
1083B	"B" Recombiner Main Fuel Line Vent	closed_____
1076B	"B" Recombiner Pilot Line Manual Containment Isolation Valve	closed_____
1084B	"B" Recombiner Main Fueling Manual Containment Isolation Valve	closed_____
M-35	"A" Recombiner H_2 Shut-off.	closed_____

5.1.2 Insert the spool piece between the waste disposal hydrogen manifold (100 psig side) and the hydrogen recombiner fuel line. _____

5.1.3 Close the manual H_2 supply header isolation valve from the hydrogen recombiner supply line. V-1082B closed_____

5.1.4 Open N_2 Supply Valve to hydrogen recombiner supply line and regulate flow. V-1082A open_____

5.1.5 Obtain the keys to the 1B hydrogen recombiner panel. _____

5.1.6 Turn switch SS12 (control power) to "on" to put power in the control circuits of the recombiner. _____

5.1.7 Unlock and open 1B hydrogen recombiner pilot manual containment isolation valve. V-1076B open_____

5.1.8 Unlock and open 1B hydrogen recombiner main fuel line manual containment isolation valve. V-1084B open__________

5.1.9 Adjust PCV-2 and PCV-3B so that GAS PRESSURE at PI-16B is 5 psi above containment pressure. __________

5.1.10 Place TRC-1B on manual control and stroke FCV-2B wide open. __________

5.1.11 Confirm by PI - 6B that pressure in the main hydrogen line is 5 psi greater than containment pressure. __________

5.1.12 Clear the containment trip signal for isolation valves IV-3B and IV-5B and obtain permission from the main control room to open the valves. DO NOT OPEN THE VALVES AT THIS TIME. __________

5.1.13 Turn control board containment isolation switch for the 1B hydrogen recombiner to "open". __________

5.1.14 Open isolation valve IV-3B by placing switch SS-10 in the "open" position. IV-3B open__________

5.1.15 Turn switch SS-6 to "manual" to open block valves BV-5B and BV-8B and close bleed valves BV-6B and BV-7B in the pilot line. __________

5.1.16 Check PI-16B to be sure pressure is above containment pressure. __________

5.1.17 Purge pilot line with Nitrogen for five (5) minutes. __________

5.1.18 Return switch SS-6 to "AUTO" to close block valves BV-5B and BV-8B and open bleed valves BV-6B and BV-7B in the pilot line. __________

5.1.19 Close IV-3B by closing switch SS-10. IV-3B closed__________

5.1.20 Lock closed the 1B hydrogen recombiner pilot line manual containment isolation valve. 1076B closed__________

5.1.21 Unlock and open the 1B hydrogen recombiner main fuel line manual containment isolation valve. 1084B open__________

5.1.22 Turn switch SS-7 to manual to open block valves BV-9B and BV-12B and close bleed valves BV-10B and BV-11B in the main fuel line. __________

5.1.23 Stroke FCV-2B from TRC-1B to set pressure at PI-6B at 5 psi above containment pressure. __________

5.1.24 Open switch SS-11 to open isolation valve IV-5B. IV-5B open__________

5.1.25 Purge the 1B hydrogen recombiner main fuel line with nitrogen for five (5) minutes. __________

5.1.26 Return switch SS-7 to "AUTO" to close block valves BV-9B and BV-12B and open bleed valves BV-10B and BV-11B in the main fuel line. __________

5.1.27 Close IV-5B by closing switch SS-11. IV-5B closed__________

5.1.28 Return TRC-1B to "AUTO". ________

5.1.29 Lock closed the 1B hydrogen recombiner main fuel line manual containment isolation valve. 1084B closed________

5.1.30 Isolate the recombiner fuel line from the waste disposal nitrogen supply by closing valve 1082A. V-1082A closed________

5.1.31 The hydrogen lines have been purged and the pressure in the piping exceeds atmospheric. Otherwise the purging process must be re-peated. ________

5.2 1B Hydrogen Recombiner Operation.

5.2.1 Verify the attached valve alignment checkoff and switch position checkoff. ________

	SWITCH	POSITION	
1.	System test - SS1	Run	________
2.	Thermocouple Selector - SS2	TC-1 or TC-2	________ ________
3.	Exciter mode switch - SS3	Auto	________
4.	Exciter Selector Switch - SS4	No. 1 or No. 2	________ ________
5.	Pilot Block & bleed valves - SS6	Auto	________
6.	Main H_2 Block and bleed valves - SS7	Auto	________
7.	Oxygen isolation valves - SS9	Center	________
8.	H_2 Pilot Isolation Valve - SS10	Center	________
9.	H_2 Main Burner Isolation Valve - SS11	Center	________
10.	Sequence Switch - SS13	Normal	________
11.	Control Power - SS12	Off	________

1B HYDROGEN RECOMBINER PRE-OPERATIONAL VALVE CHECKOFF

VALVE NO.	NAME	POSITION
M-51	"B" Recombiner H_2 Shut-off	open________
M-54	FT-2B Isolation	open________
M-55	FT-2B Isolation	open________
M-56	FT-2B Bypass	closed________
M-57	FT-2B Vent	closed________

VALVE NO.	NAME	POSITION
M-58	FT-2B Vent	closed__________
M-52	"B" Recombiner H_2 Supply Line Vent	closed__________
M-53	"B" Recombiner H_2 Supply Line Vent	closed__________
M-59	"B" Recombiner H_2 Supply Line Vent	closed__________
M-60	PI-5B and PI-8B Shutoff	open__________
M-61	PI-13B Shut-off (supply)	open__________
M-62	PI-14B Shut-off (Main Fuel Line)	open__________
M-63	PI-6B and PT-2B Shut-off (Main Fuel Line)	open__________
M-64	PI-15B Shut-off (Pilot Line)	open__________
M-65	PI-16B and PT-9B Shut-off (Pilot Line)	open__________
1B	Recombiner Dampers (in C.V.)	open__________
1075B	"B" Recombiner Pilot Line Vent	closed__________
1083B	"B" Recombiner Main Fuel Line Vent	closed__________
1076B	"B" Recombiner Pilot Line Manual Containment Isolation Valve.	closed__________
1084B	"B" Recombiner Main Fuel Line Manual Containment Isolation Valve.	closed__________
M-35	"A" Recombiner H_2 Shut-off.	closed__________

OXYGEN SUPPLY LINE

VALVE NO.	NAME	POSITION
M-1	O_2 Filter Isolation	open__________
M-2	O_2 Filter Isolation	open__________
M-3	O_2 Filter Vent	closed__________
M-4	O_2 "A" Supply Line Isolation	closed__________
M-5	O_2 "B" Supply Line Isolation	closed__________
M-6	O_2 "A" Supply Line Vent	closed__________
M-7	O_2 "B" Supply Line Vent	closed__________
M-8	O_2 FT-1A Isolation	open__________
M-9	O_2 FT-1B Isolation	open__________

VALVE NO.	NAME	POSITION
M-10	O_2 FT-1A Isolation	open________
M-11	O_2 FT-1B Isolation	open________
M-12	O_2 FT-1A Bypass	closed________
M-13	O_2 FT-1B Bypass	closed________
M-14	O_2 FT-1A Vent	closed________
M-15	O_2 FT-1B Vent	closed________
M-16	O_2 FT-1A Vent	closed________
M-17	O_2 FT-1B Vent	closed________
M-18	O_2 "A" Supply Line Vent	closed________
M-19	O_2 "B" Supply Line Vent	closed________
M-20	O_2 "A" Supply Filter Isolation	open________
M-21	O_2 "B" Supply Filter Isolation	open________
M-22	O_2 "A" Supply Filter Vent	closed________
M-23	O_2 "B" Supply Filter Vent	closed________
M-24	O_2 "A" Supply Filter Isolation	open________
M-25	O_2 "B" Supply Filter Isolation	open________
M-26	PI-2A and PT-7A Shut-off	open________
M-27	PI-2B and PT-7B Shut-off	open________
M-28	PI-11A Shut-off	open________
M-29	PI-11B Shut-off	open________
M-30	PI-12A Shut-off	open________
M-31	PI-12B Shut-off	open________
M-32	PT-1A and PI-3A Shut-off	open________
M-33	PT-1B and PI-3B Shut-off	open________
M-34	PI-1 Shut-off	open________
1079	O_2 Supply Lines "A" and "B" Vent	closed________
1080A	O_2 Supply Manual Containment Isolation Valve	closed________

5.2.2	Select which pressure regulator PCV-1041 or PCV-1042 in the waste disposal system hydrogen supply manifold is going to be used.	PCV-1041 ________
		PCV-1042 ________
5.2.3	If using PCV-1041, isolate PCV-1042 by closing the inlet and outlet isolation valves.	V-1871 closed ________
		V-1872 closed ________
5.2.4	If using PCV-1042, isolate PCV-1041 by closing the inlet and outlet isolation valves.	V-1873 closed ________
		V-1874 closed ________
5.2.5	Open the shut-off valve between the recombiner fuel line and the waste disposal hydrogen supply.	V-1082B open ________
5.2.6	Unlock and open the manual containment isolation valve in the 1B Hydrogen Recombiner pilot line.	V-1076 open ________
5.2.7	Unlock and open the manual containment isolation valve in the 1B hydrogen recombiner main fuel line.	V-1084B open ________
5.2.8	Turn switch SS-12 (control power) to "on" to put power in the control circuits of the recombiner.	________
5.2.9	Confirm fuel line pressure exceeds containment pressure on PI-13B.	________
5.2.10	If the oxygen concentration in containment is less than 8% by volume perform the following steps. If oxygen enrichment is not necessary proceed to step 5.2.18.	________
5.2.11	Open the "B" oxygen supply line isolation valve.	M-5 open ________
5.2.12	Confirm the "A" oxygen supply line isolation valve is closed.	M-4 closed ________
5.2.13	Unlock and open the oxygen supply manual containment isolation valve.	V-1080A open ________
5.2.14	Set ratio control RC-1 at desired ratio.	________
5.2.15	Open valving from truck to pressurize the oxygen line.	________
5.2.16	Confirm pressure at PI-2B is greater than containment pressure.	________
5.2.17	Obtain permission from the main control room to open IV-1B and IV-2B, but <u>DO</u> <u>NOT</u> open the valves now.	________

5.2.18 Select one of the two exciter circuits for operation by switch SS-4. EX-#1__________

EX-#2__________

5.2.19 Confirm exciter mode switch SS-3 is in "AUTO". __________

5.2.20 Select the control thermocouple to be used by switch SS-2. TC-1__________

TC-2__________

5.2.21 Open 1B hydrogen recombiner pilot isolation valve, IV-3B, by switch SS-10, with permission from main control room. IV-3B open__________

5.2.22 Open 1B hydrogen recombiner main fuel line isolation valve, IV-5B, by switch SS-11, with permission from main control room. IV-5B open__________

5.2.23 Verify that the area near the 1B hydrogen recombiner is clear of all non-essential personnel. __________

5.2.24 Start the blower. __________

5.2.25 Set TRC-1B to control at 800°F. __________

5.2.26 When the "end of purge" light comes on, press "flame start" button. Ensure that TRC-1B is within 100°F of the temperature during the temperature increase. __________

5.2.27 Light-off from this point to main burner ignition is automatically sequenced. When steady main burner lightoff is proved as indicated by a steady thermocouple readout, 800°F, bring the combustor temperature up to the desired operating temperature over a ten (10) minute period by adjusting TRC-1B in 100°F increments until 1400°F is reached. __________

5.2.28 If oxygen is to be added to containment perform the following steps. If enrichment is not necessary proceed to step 5.2.31. __________

5.2.29 Confirm "B" oxygen supply line pressure is above containment pressure at PI-3B. __________

5.2.30 Open the oxygen line containment isolation valves, IV-1B and IV-2B by switch SS-9. IV-1B open__________

IV-2B open__________

5.2.31 When subsequent samples of the containment atmosphere indicate that the hydrogen concentration has been reduced to the desired level (Below 2%) the system is to be shutdown. __________

5.2.32 Press the "flame-stop" button. __________

5.2.33 Confirm that the following have happened:

a) IV-3B and IV-5B closed. ________
b) BV-5B, BV-8B, BV-9B, BV-12B closed. ________
c) BV-6B, BV-7B, BV-10B,BV-11B open. ________
d) FR-1B No Flow. ________
e) TRC-1B is coasting down. ________

5.2.34 Close the oxygen line containment isolation valves IV-1B and IV-2B, by switch SS-9.
IV-1B closed________

IV-2B closed________

5.2.35 Lock closed the following manual containment isolation valves:

V-1076B	Pilot Line	closed________
V-1084B	Main Fuel Line	closed________
V-1080A	Oxygen Line	closed________

5.2.36 Turn off the blower when TRC-1B reaches 500°F. ________

5.2.37 Close the hydrogen and oxygen supply line shut-off valves.
M-51 closed________

M-5 closed________

5.2.38 Turn switch SS-12 to "OFF" to cut power to the panel control circuits. ________

5.2.39 Close the shut-off valve between the recombiner fuel line and the waste disposal hydrogen supply. V-1082B closed________

5.2.40 Repeat system piping purge with nitrogen step 5.1. ________

5.2.41 Remove spool piece between the waste disposal hydrogen manifold (100 psig side) and the hydrogen recombiner fuel line. ________

COMPLETED BY:________________________

DATE COMPLETED:________________________

SHIFT FOREMAN:________________________

GINNA STATION
UNIT #1
COMPLETED

DATE:-

TIME:-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. HP-1.4 REV. NO. 3

NOBLE GAS EXPOSURE

TECHNICAL REVIEW

PORC 3/3/80

TRSchuler
QC REVIEW

3-5-80
DATE

APPROVED FOR USE

Bruce A Snow
PLANT SUPERINTENDENT

3-5-80
DATE

QA x NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 6 PAGES

HP-1.4

NOBLE GAS EXPOSURE

1.0 PURPOSE:

1.1 To provide a procedure that describes the analysis, frequency and record keeping requirements associated with noble gas exposure.

2.0 REFERENCES:

2.1 10 CFR 20.101, .201, .401

2.2 RD-1.2 - Containment Radiogas, Sampling and Analysis

3.0 PRINCIPLE:

3.1 Exposure to air activity, both particulate and gaseous, may result in internal exposure. The limits are based on 10 CFR 20 Appendix B, Table I, Column 1. However, for radioactive materials designated "Sub" in the "Isotope" column of Appendix B, Table 1, Column 1 of 10 CFR 20, the concentration value specified is based upon exposure to the material as an external radiation source since the internal exposure is minimal. Individual exposures to these materials can be accounted for as part of the limitation on individual dose in accordance with 10 CFR 20.101. The gamma exposure from these radioactive "noble gases" is accounted for by both film and self reading pocket dosimeter. The skin exposure is accounted for by isotopic analysis of the gas mixture and calculating the dose rate from beta plus gamma radiation.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 Gas sample container; 35 ml glass bulb or Marinelli beaker.

4.2 Multichannel analyzer and Ge(Li) detector.

5.0 PRECAUTIONS AND LIMIT VALUES:

5.1 The skin of whole body limit for beta plus gamma exposure is 7.5 rem per quarter.

5.2 The skin dose from noble gas must be accounted for when the dose rate exceeds 3.5 mrem/hour since above this rate the quarterly skin dose could exceed 25% of the limit.

6.0 INSTRUCTIONS:

6.1 When the Containment has not been purged, collect a gas sample per RD-1.2 for the entry into the containment vessel.

6.2 Analyze the sample as soon as practical using the computer program (+FX 1111) or gas calculation forms. (Attachments I or II)

6.3 If available, use computer printout for total skin dose rate, and complete Attachment IV for each individual if skin dose rate is greater than 3.5 mRem/hour.

6.4 If computer printout is not available complete Attachments III and IV for each individual if skin dose rate is greater than 3.5 mRem/hour.

6.5 Have the form reviewed and signed by the Health Physicist.

6.6 Record the skin exposure on the individuals exposure record.

6.6.1 If the dose rate is less than 3.5 mrem/hour, it is not necessary to account for skin exposure. Attach the noble gas exposure form to the SWP and completion of steps 6.7 and 6.8 are not necessary.

6.7 Have the form reviewed and signed by the Health Physicist.

6.8 Record the skin exposure on the individuals exposure record (NRC form 5 or equivalent).

Attachment I
Refer to HP-1.4 or
HP-11.3 for instructions

________ GAS SAMPLING DATA SHEET
FOR 2500 CC MARINELLI BREAKER ON GELI CRYSTAL

DATE: ______________ TIME: ______________ ANALYST: ____________

ANALYZE FOR: ______________________________________ CHECKED BY: ____________

REMARKS:

CALCULATIONS:

		Numerator	Denominator		
0.081 MEV Xe - 133 (5.27d)	=	(-) ( )	( )*(0.022) (0.371) (37000) (2500 CC) time eff. abund. dps/µCi	=	________ µCi/cc
0.150 MEV Kr - 85M (4.4h)	=	(-) ( )	( )*(0.027) (0.74) (37000) (2500 CC)	=	________ µCi/cc
0.164 MEV Xe - 131M (11.8d)	=	(-) ( )	( )*(0.025) (0.02) (37000) (2500 CC)	=	________ µCi/cc
0.196 MEV Kr - 88 (2.8h)	=	(-) ( )	( )*(0.021) (0.35) (37000) (2500)	=	________ µCi/cc
0.233 MEV Xe - 133M (2.26d)	=	(-) ( )	( )*(0.017) (0.14) (37000) (2500)	=	________ µCi/cc
0.249 MEV Xe - 135 (9.2h)	=	(-) ( )	( )*(0.016) (0.92) (37000) (2500 CC)	=	________ µCi/cc
0.258 MEV Xe - 138 (17m)	=	(-) ( )	( )*(0.016)(1.00) (37000) (2500)	=	________ µCi/cc
0.403 MEV Kr - 87 (76m)	=	(-) ( )	( )*(0.0098)(0.50) (37000) (2500)	=	________ µCi/cc
0.514 MEV Kr - 85 (10.76y)	=	(-) ( )	( )*(0.0077)(0.0041)(37000)(2500 CC)	=	________ µCi/cc
0.527 MEV Xe - 135m (15.6m)	=	(-) ( )	( )*(0.0074)(0.80) (37000) (2500)	=	________ µCi/cc
1.294 MEV Ar - 41 (1.83h)	=	(-) ( )	( )*(0.0030)().99) (37000) (2500 CC)	=	________ µCi/cc

Decay Factor = $e^{\frac{(.693)\,(time)}{(half\ life)}}$

Total Gas Activity = ________ µCi/cc

NOTE: The time and half life must be in the same units.

* Efficiency is for Ge(Li) contact. For other counting systems, check calibrabration sheets.

Attachment II
Refer to HP-1.4
RD 6 & RD 1.2

____________________GAS SAMPLING DATA SHEET
COUNTED IN 35 ml BULB AT 18 mm ON GE(LI) CRYSTAL.

Date: ________________ Time: ________________ By: ____________________

Checked by: ____________________

(Mev. T 1/2)

(0.081, 5.27d.) Xe^{133} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.371)^{*}(0.0136)(35)}$ = ____________ µCi/cc

Time Sec / ABUND / EFF / cc

(0.1495, 4.4 hr) Kr^{85m} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.74)^{*}(0.017)(35)}$ = ____________ µCi/cc

(0.1639, 11.8d) Xe^{131m} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(.02)^{*}(0.0155)(35)}$ = ____________ µCi/cc

(0.196, 2.8h) Kr^{88} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(.35)^{*}(0.0130)(35)}$ = ____________ µCi/cc

(0.2328, 2.26d) Xe^{133m} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.14)^{*}(0.0108)(35)}$ = ____________ µCi/cc

(0.2486, 9.14 hr) Xe^{135} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.92)^{*}(0.0101)(35)}$ = ____________ µCi/cc

(0.258), 17m) Xe^{138} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(1.00)^{*}(0.0098)(35)}$ = ____________ µCi/cc

(0.403), 76m) Kr^{87} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.50)^{*}(0.0062)(35)}$ = ____________ µCi/cc

(0.514, 10.76 yr) Kr^{85} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.0041)(0.00485)(35)}$ = ____________ µCi/cc

(0.527, 15.6m) Xe^{135m} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.80)^{*}(0.0047)(35)}$ = ____________ µCi/cc

(1.294, 1.83 hr) Ar^{41} = $\dfrac{(\qquad\qquad)}{(3.7\times10^{4})(\quad)(0.99)(0.0019)(35)}$ = ____________ µCi/cc

Total Activity = ____________ µCi/cc

* Efficiency is for Ge(Li) @ 18mm. For other counting systems or geometries, check calibration sheets

Refer to HP-1.4
For Instructions

ATTACHMENT III

NOBLE GAS EXPOSURE FORM

Work Permit # ______________________ Date: ____________

EXPOSURE (MREM/HR)

Skin Dose Factor X Concentration = Skin Dose Rate

Isotope	mrem/hour per μCi/ml	μCi/ml	Skin Dose Rate
Kr-85M	3.2×10^6		
Kr-85	1.6×10^5		
Kr-87	2.6×10^6		
Kr-88	2.0×10^6		
Xe-131M	7.4×10^6		
Xe-133M	1.5×10^5		
Xe-133	6.9×10^4		
Xe-135	4.9×10^5		
Xe-138	1.7×10^6		

Total = ________ mrem/hour

ANALYST: ______________

CHECKED BY: ______________

Refer to HP-1.4
for instructions

ATTACHMENT IV

NOBLE GAS EXPOSURE FORM
(Utilizing computer printout or Attachment III)

Work Permit # ______________________ Date: ______________

Time in: ______________ ______________ ______________

Time out: ______________ ______________ ______________

Total Time: (4Hr.) __________

Name: ______________

Skin Exposure = Time(HR) ________ X Skin Dose Rate ________ = ________ mRem

ANALYST: ______________________

REVIEWED BY: ______________________
Plant Health Physicist

GINNA STATION
UNIT #1
COMPLETED

DATE:-

TIME:-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. HP-11.2 REV. NO. 9

IODINE IN AIR- CHARCOAL CARTRIDGE METHOD

TECHNICAL REVIEW

PORC 2/11/80

TRSchuler
QC REVIEW

2-25-80
DATE

APPROVED FOR USE

Bruce A. Snow
PLANT SUPERINTENDENT

2-26-80
DATE

QA x NON-QA ____ CATEGORY 1.0

REVIEWED BY: ____________

THIS PROCEDURE CONTAINS 4 PAGES

HP-11.2

IODINE IN AIR - CHARCOAL CARTRIDGE METHOD

1.0 PURPOSE:

1.1 This procedure explains the necessary steps to determine the concentration of Iodine in air using a charcoal cartridge.

2.0 REFERENCES:

2.1 HP-11.5, Constant Air Monitors

3.0 PRINCIPLE:

3.1 A measured volume of air is passed through a charcoal cartridge, which absorbs the iodine. The charcoal from the cartridge is placed in a beaker and counted on a gamma spectrometer to determine the iodine concentration in the air.

4.0 PREREQUISITES AND NEEDED EQUIPMENT OR REAGENTS:

4.1 Particulate Prefilter

4.2 Charcoal cartridge (SAI # CP 100 or equivalent)

4.3 NMC constant air monitor, Model AM-2I, NMC Constant Air Monitor, Model AM-21F

4.4 Fixed Filter Holder in R13, 14 (Plant Vent)

4.5 Fixed Filter Holder in R11, 12 (Containment Vent)

4.6 Trapelo MAP 63 for R10A (Containment) R10B (Plant Vent)

4.7 250 ml plastic bottle, glass stirring rod

4.8 Gamma Spectrometer

4.9 Analysis data sheet

5.0 PRECAUTIONS AND LIMIT VALUES:

5.1 Xenon gas will be absorbed by the charcoal along with the iodine. If enough xenon is present to interfere with counting, it may be removed by purging the cartridge with air.

5.2 Air flow through the charcoal cartridge should not exceed 5 cfm. to insure proper contact time and 100% collection efficiency.

5.3 The occupational MPC for Iodine 131 is 9×10^{-9} μCi/me.

6.0 <u>INSTRUCTIONS:</u>

6.1 Install prefilter and charcoal cartridge in appropriate holder.

6.2 If cartridge doesn't fit snugly, tape in place.

6.3 Record start date, time, flow, vacuum, and other pertinent information on data sheet.

6.3.1 For R10A and R10B, start pump and call control for start reading on plant monitor and record on data sheet.

6.3.2 For CAM units, record proper information on log book located in the unit.

6.4 At the end of the sample period, record stop date, time, flow, and vacuum on data sheet.

6.4.1 For R10A and R10B, call Control for stop reading on the plant monitor and record on data sheet.

6.4.2 On CAM units, record proper information on log book located in the unit.

6.5 Remove charcoal cartridge and/or particulate filter for counting.

6.6 Count particulate filter and record data on log sheet.

6.6.1 Plant unit particulate samples should be placed in an envelope and saved for beta alpha and isotopic analysis. The beta and alpha counts should be allowed a 24 hr. decay and the isotopic analysis is done on a composite of all filters monthly per RD-3.

6.7 If the air being sampled is suspected to have had high noble gas activity, the cartridge should be purged with air for approximately one half hour before counting.

6.8 Break the cartridge open and place the charcoal in the bottom half of a 250 ml plastic bottle and mix well with a glass stirring rod.

6.9 Count on the γ Spect. counting system.

6.10 Calculate the activities of I^{131} (364 KEV) and I^{133} (529 KEV), using the data sheet and proper decay corrections when applicable.

6.11 Results should be recorded on proper logs.

6.11.1 Plant vent data should be filed with monthly report data.

6.11.2 CAM data can be recorded on an "Air Activity Log Sheet" or on an SWP.

Attachment I
Refer to HP-11.2
for Instructions

PARTICULATE AND IODINE ANALYSIS

FOR USE WITH NMC AND R-10A & R-10B MONITORS

SAMPLE: ☐ Plant Vent ☐ Containment Vent ☐ Containment ________ MONITOR: ☐ R-10B ☐ R-10A ☐ ________

	TIME	DATE	CFM	VACUUM	CPM
Sample on	____	____	____	____	____
Sample off	____	____	____	____	____
Minutes Sampled	____	Avg. =	____	____	____delta cpm

Vacuum Correction ________ X CFM ________ = ________cfm STP

Volume Sampled = ________cfm X ________Min. X 2.83 X E4 = ________cc STP

Volume Release = ________cfm X ________Min. X 2.83 X E4 = ________cc STP

uCi/cc I^{131} = $\dfrac{\left[\left(\quad\right) - \left(\quad\right)\right]\left(\quad\right)}{\left(\frac{\quad}{\text{Time}}\text{ sec}\right)\left(\frac{.0053}{\text{Eff.}}\right)^{*}\left(\frac{.82}{\text{Abund.}}\right)\left(\frac{.\quad E}{\text{cc STP}}\right)\left(\frac{3.7 \times 10}{}\right)}$ = ________

uCi/cc I^{131} = $\left[\left(\frac{\quad}{\text{Min.}}\right) - \left(\frac{\quad}{\text{cfm STP}}\right)\right]\left(1 \times 10^{-9}\right)$ R-10A or B = ________

uCi/cc I^{133} = $\dfrac{\left[\left(\quad\right) - \left(\quad\right)\right]\left(\quad\right)}{\left(\frac{\quad}{\text{Time}}\text{ sec}\right)\left(\frac{.0038}{\text{Eff.}}\right)^{*}\left(\frac{.89}{\text{Abund.}}\right)\left(\frac{.\quad E}{\text{cc STP}}\right)\left(\frac{3.7 \times 10}{}\right)}$ = ________

uCi/cc Gross Beta = $\dfrac{\left(\quad\right) - \left(\quad\right)}{\left(\quad\text{Min}\right)\left(\frac{\quad}{\text{Eff.}}\right)\left(\frac{.\quad E}{\text{cc STP}}\right)\left(2.22\text{ E6}\right)}$ = ________

uCi/cc Gross Alpha = $\dfrac{\left(\quad\right) - \left(\quad\right)}{\left(\quad\text{Min}\right)\left(\frac{\quad}{\text{Eff.}}\right)\left(\frac{.\quad E}{\text{cc STP}}\right)\left(2.22\text{ E6}\right)}$ = ________

NOTE: * Efficiencies are for Geli @ 18 mm. For other counting systems, check Calibration Sheets.

Refer to HP-11.2
for Instructions

Attachment I (Cont'd)

uCi I^{131} released = = ______________uCi/cc X ______________ cc = ______________

uCi I^{133} released = = ______________uCi/cc X ______________ cc = ______________

uCi Gross Beta Released = ______________uCi/cc X ______________ cc = ______________

uCi Gross Alpha Released = ______________uCi/cc X ______________ cc = ______________

Date Analyzed: ______________________________

Analyst: ______________________________

Checked By: ______________________________

$$\frac{\text{uCi } I^{131}}{\text{minutes sampled} \times 60} = \text{uCi/sec.}$$

$$\frac{\text{uCi } I^{131}}{\times 60} = \text{uCi/sec.}$$

GINNA STATION
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DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. HP-11.3   REV. NO. 2

NOBLE GAS SAMPLING AND ANALYSIS UTILIZING A MARINELLI BEAKER

TECHNICAL REVIEW

PORC 2-11-80

TRSchuler
QC REVIEW   2-25-80
DATE

APPROVED FOR USE

B J [illegible]
PLANT SUPERINTENDENT   2-26-80
DATE

QA X   NON-QA ____   CATEGORY 1.0

REVIEWED BY: ____________ ____________

THIS PROCEDURE CONTAINS 4 PAGES

HP-11.3

NOBLE GAS SAMPLING AND ANALYSIS UTILIZING A MARINELLI BEAKER

1.0 PURPOSE:

1.1 To provide instructions for obtaining and analyzing a sample of gas or air to determine the identity and concentration of gamma emitting noble gases.

1.2 To provide instructions for collection and counting of low activity noble gas samples using a Marinelli beaker.

2.0 REFERENCES:

2.1 RD-1.2, Containment Radiogas Sampling and Analysis

2.2 RD-4, Vent Radiogas Background and Factor Determination

2.3 RD-5, Ventilation System Releases

2.4 HP-1.4, Noble Gas Exposure

2.5 HP-9.2, Primary to Secondary Leakage Detection and Measurement

2.6 HP-9.3, Air Ejector Gas Sampling

3.0 PRINCIPLE:

3.1 The atmosphere to be analyzed is drawn through a Marinelli beaker. The sample is contained in the beaker by closing the stopcocks. The beaker has a unique geometry that optimizes sample volume and detection efficiency which results in a lower limit of detection than can be obtained with other counting methods. The Marinelli beaker is used when the concentrations of noble gas are too small to be accurately measured using the Standard 35 cc glass bulb.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 Marinelli Beaker, 2.5 liter with stopcocks

4.2 Vacuum pump and sample tubing

4.3 Radiogas Data Sheet for Marinelli Beaker (attached)

4.4 Gamma Spectrometer

5.0 PRECAUTIONS AND LIMIT VALUES:

5.1 Do not use a Marinelli beaker to determine concentrations of iodine in air. Iodine can plate out and build up on the inside surfaces of the beaker giving results that can be high by several orders of magnitude.

5.2 Do not use a Marinelli beaker for sampling containment air if the R12 radiogas monitor exceeds 20,000 cpm. Collect the sample in a 35 ml bulb to minimize the dead time on the gamma detector.

5.3 Call the Control Room before drawing a containment air sample through the R11/R12 sample line. Ensure the R11/R12 sample line is aligned to sample containment air.

5.4 Protect the sampling devices from external contamination so that the counting equipment will not become contaminated.

6.0 <u>INSTRUCTIONS</u>:

6.1 Before collecting a sample, purge the Marinelli Beaker with clean air for approximately one-half hour. Do not overpressurize the beaker.

6.2 Place the Marinelli on the Ge(Li) detector and count a 4000 second background. Shorter count times can be used for higher activity samples.

6.3 Collect the sample as follows:

6.3.1 Connect a piece of tubing (if necessary) from the sample point to one stopcock of the beaker.

6.3.2 Connect a piece of tubing between the other stopcock and the suction side of a vacuum pump.

6.3.3 Open the stopcocks, start the pump and run for five to ten minutes.

6.3.4 Stop the pump and close the stopcocks.

6.3.5 Disconnect the beaker and count on the Ge(Li) detector.

6.3.6 Calculate the activity using the data sheet or the computer printout.

6.4 Special sample points.

6.4.1 Plant Vent

6.4.1.1 Sample point is located in the vent monitor room on the top floor of the intermediate building north end. Insert sample probe in the west duct.

6.4.2 Containment Vent

6.4.2.1 Sample point is located in the vent monitor room on the top floor of the intermediate building north end. Insert sample probe in the east duct.

6.4.3 Air Ejector

6.4.3.1 Sample as per HP-9.3

6.4.4 Containment Air

6.4.4.1 Sample point is located at the R11/R12 sample line in the intermediate building second level by the steam header.

6.4.4.2 Connect the beaker and a flow meter between valves 1593 and 1595.

6.4.4.3 Notify Control Room before operating valves as it could cause a low flow alarm on R11/R12.

6.4.4.4 Open valves 1593 and 1595 and throttle the bypass valve 1594 until there is flow through the beaker of at least one liter per minute (2 cfh).

6.4.4.5 After 10 minutes, open valve 1594, close the stopcocks on the beaker and close valves 1593 and 1595.

6.4.4.6 Disconnect beaker and count on the Ge(Li) detector.

Attachment I
Refer to HP-1.4 or
HP-11.3 For Instructins

GAS SAMPLING DATA SHEET
FOR 2500 CC MARINELLI BEAKER ON GELI CRYSTAL

DATE: ______________ TIME: ______________ ANALYST: ______________

ANALYZE FOR: ______________________________ CHECKED BY: ______________

REMARKS:

CALCULATIONS:

Energy / Nuclide (half life)	=	Numerator	Denominator	=	Result
0.081 MEV Xe - 133 (5.27d)	=	(-) ( )	(time)*(0.022) eff. (0.371) abund. (37000) dps/µCi (2500 CC)	=	______ µCi/cc
0.150 MEV Kr - 85M (4.4h)	=	(-) ( )	( )*(0.027) (0.74) (37000) (2500 CC)	=	______ µCi/cc
0.164 MEV Xe - 131M (11.8d)	=	(-) ( )	( )*(0.024) (0.02) (37000) (2500 CC)	=	______ µCi/cc
0.196 MEV Kr - 88 (2.8h)	=	(-) ( )	( )*(0.0205) (0.35) (37000) (2500)	=	______ µCi/cc
0.233 MEV Xe - 133M (2.26d)	=	(-) ( )	( )*(0.018) (0.14) (37000) (2500)	=	______ µCi/cc
0.249 MEV Xe - 135 (9.2h)	=	(-) ( )	( )*(0.016) (0.92) (37000) (2500 CC)	=	______ µCi/cc
0.258 MEV Xe - 138 (17m)	=	(-) ( )	( )*(0.0155)(1.00) (37000) (2500)	=	______ µCi/cc
0.403 MEV Kr - 87 (76m)	=	(-) ( )	( )*(0.0198)(0.50) (37000) (2500)	=	______ µCi/cc
0.514 MEV Kr - 85 (10.76y)	=	(-) ( )	( )*(0.0075)(0.0041)(37000)(2500 CC)	=	______ µCi/cc
0.527 MEV Xe - 135m (15.6m)	=	(-) ( )	( )*(0.0074)(0.80) (37000) (2500)	=	______ µCi/cc
1.294 MEV Ar - 41 (1.83h)	=	(-) ( )	( )*(0.0030)().99) (37000) (2500 CC)	=	______ µCi/cc

Decay Factor = $e^{\frac{(.693)\ (\text{time})}{(\text{half life})}}$

Total Gas Activity = ______ µCi/cc

NOTE: The time and half life must be in the same units.

* Efficiency is for Ge(Li) contact. For other counting systems, check calibration sheets.

GINNA STATION
UNIT #1
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DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. HP-9.3 REV. NO. 6

AIR EJECTOR GAS SAMPLING

TECHNICAL REVIEW

PORC 8/20/79

TRSchuler
Q/C REVIEW

8-22-79
DATE

APPROVED FOR USE

[signature]
PLANT SUPERINTENDENT

8-23-79
DATE

QA X NON-QA ____ CATEGORY ____ THIS PROCEDURE CONTAINS 4 PAGES

LIFETIME ____ NONPERMANENT ____ REC. CENTRAL RECORDS DATE ____

REVIEWED BY ____ DATE ____ DISP. DATE ____

HP-9.3

AIR EJECTOR GAS SAMPLING

1.0 PURPOSE:

1.1 To obtain a sample of the air ejector off gas.

2.0 REFERENCES:

2.1 RG&E Print #33013-528

2.2 Gas Sample Procedures HP-11.1 and HP-11.3

3.0 PRINCIPLE:

3.1 The steam jet air ejector pulls a vacuum on the condenser which removes the noncondensible gasses from the secondary system and discharges it to the gland steam discharge line.

3.2 The sample from the air ejector must be cooled to remove the water vapor so only the noncondensible gasses are sampled.

3.3 If a flow measurement is required the air ejector outlet must be isolated from the main steam.

3.4 Also, one of the steam jets on the air ejector should be isolated to minimize the amount of steam which must be condensed if the total flow is discharged through the sample cooler.

4.0 PREREQUISITES AND NEEDED MATERIAL:

4.1 Cooling Apparatus

4.2 Water Trap

4.3 Flow Meter (if flow measurement is necessary)

5.0 PRECAUTIONS:

5.1 When isolating the air ejector, insure that there is an open path to the room so that the air ejector doesn't become pressurized.

6.0 INSTRUCTIONS:

NOTE: Steps 6.1.1 - 6.1.12 describe the method to obtain a sample for analysis of the air ejector off gasses without isolation from the gland steam. Steps 6.2.1 - 6.2.20 describe the method to obtain a sample and total flow rate of the noncondensible gasses from the air ejector. Therefore, mark N/A the steps which do not apply for the type of sample being obtained.

6.1 To obtain a sample of the air ejector off gas without isolation from the gland steam system

6.1.1 Open V-3297 loop seal. ______

6.1.2 Open V 3247. ______

6.1.3 Open V 3299 inlet to cooling system. ______

6.1.4 Open cooling water inlet to cooler and check drain to insure flow. ______

6.1.5 Open Inlet to sample condenser. ______

6.1.6 Open drain line from water trap. ______

6.1.7 Attach sampling device (Marinelli beaker, glass bulb, etc.) ______

6.1.8 After water has drained from condenser and water trap, close drain valve (if water begins to build up in trap, drain valve may be cracked open to keep water out of sampling device). ______

6.1.9 Allow at least 5 minutes purge time before removing sampling device . ______

6.1.10 Close valve 3299 and the inlet valve to sample cooler. ______

6.1.11 Close cooling water inlet to sample cooler. ______

6.1.12 Open V-3297. ______

NOTE: V 3247 may be left open without affecting system operation.

6.2 To obtain sample of air ejector off gas while isolated from gland steam system (total off gas flow will be directed to sample system and or room).

6.2.1 Contact shift foreman for approval and operator assistance. ______

6.2.2 Open V 3247. ______

6.2.3 Open V 3299. ______

6.2.4 Open V 3298. ______

6.2.5 Open cooling water inlet to sample cooler and check drain line to insure flow. ______

6.2.6 Open sample inlet to sample cooler. ______

6.2.7 Open drain valve on water trap. ______

6.2.8 Notify Control Room that one of the air ejector steam jets is being removed from service and the air ejector is being isolated from the gland steam system. ________

6.2.9 Slowly close V-3236 to remove the steam jet from service. ________

6.2.10 Close V 3588. ________

6.2.11 Close V-3297. ________

6.2.12 Close V-3242 to isolate the air ejector from the gland steam system. ________

6.2.13 Attach flow meter or sample device to the outlet of the water trap. ________

6.2.14 Close the water trap drain. (If water builds up in trap the drain may have to be reopened to keep water out of the sampling device). ________

6.2.15 To control the flow through the sampling device, slowly throttle V 3298 while watching PI 2065 and 2066 to ensure the condenser vacuum remains the same. (To measure total noncondensible gas flow, V 3298 must be completely closed). ________

flow rate ________cfm

NOTE: When valve 3298 is closed an imbalance can exist between the air ejector inner condenser and the main condenser pressures. This may cause the condensate recirc. valve to go open reducing condensate and feedwater pressure. Also, a slight reduction in condenser vacuum may result.

6.2.16 When sampling is completed open V 3242. ________

6.2.17 Close V-3299 and the inlet valve to the sample cooler. ________

6.2.18 Open V 3588. ________

6.2.19 Slowly open V 3236 to return steam jet to service. ________

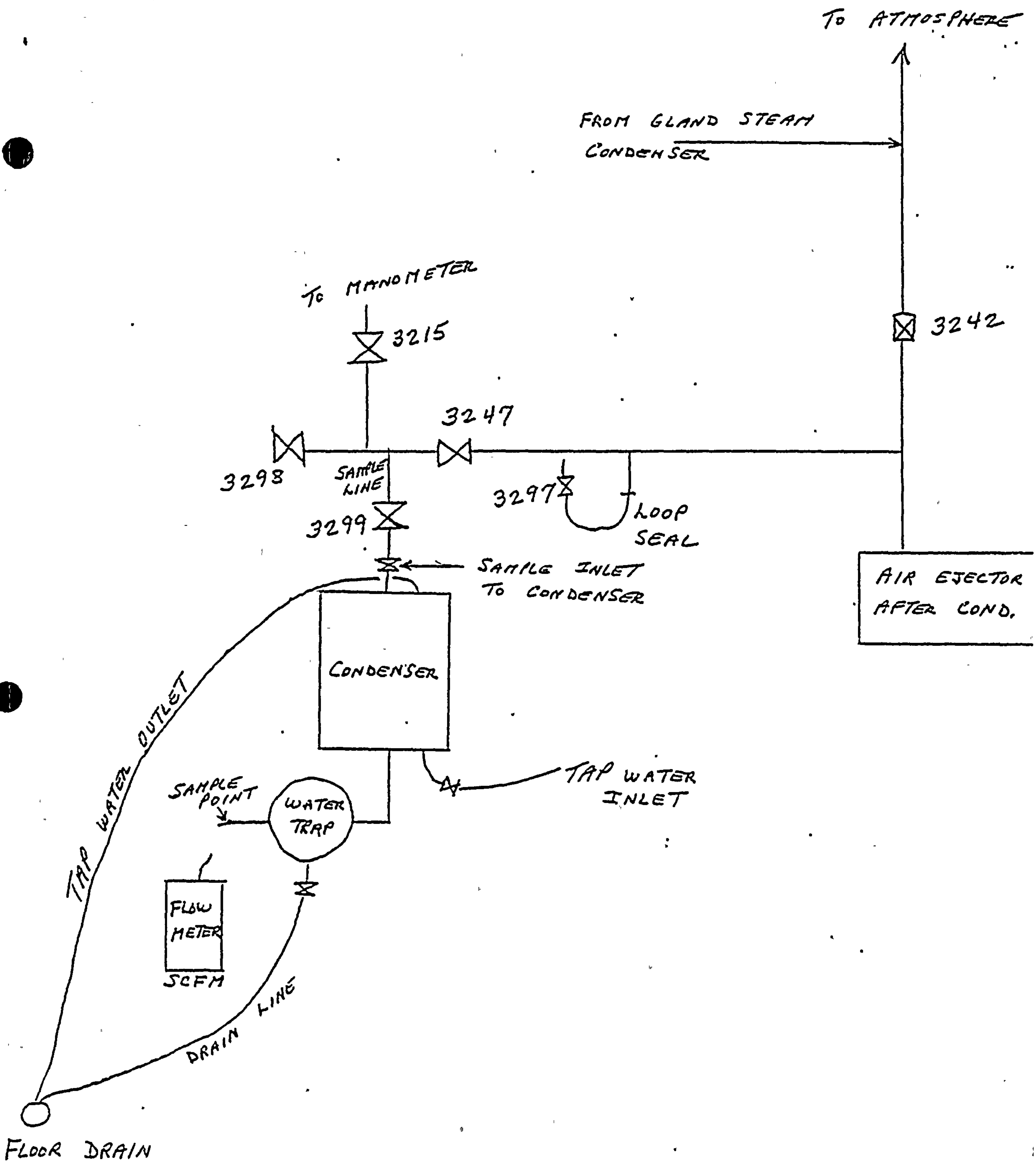
6.2.20 Close cooling water inlet to the sample cooler. ________

6.2.21 Open V-3297. ________

COMPLETED BY: ________________

DATE COMPLETED: ________________

SUPERVISOR OF CHEM & HEALTH PHYSICS: ________________



TO ATMOSPHERE
FROM GLAND STEAM CONDENSER
TO MANOMETER
3215
3242
3247
3298
SAMPLE LINE
3297
LOOP SEAL
3299
SAMPLE INLET TO CONDENSER
AIR EJECTOR AFTER COND.
CONDENSER
TAP WATER OUTLET
TAP WATER INLET
SAMPLE POINT
WATER TRAP
FLOW METER
SCFM
DRAIN LINE
FLOOR DRAIN

GINNA STATION
UNIT #1
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DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. HP-11.11 REV. NO. 0

GAS SAMPLING AND ANALYSIS UTILIZING A 35 cc GLASS BULB

TECHNICAL REVIEW

PORC 2-19-80

TR Schuler
QC REVIEW

2-28-80
DATE

APPROVED FOR USE

PLANT SUPERINTENDENT

3.3.80
DATE

QA x NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________

THIS PROCEDURE CONTAINS 3 PAGES

HP-11.11

GAS SAMPLING AND ANALYSIS UTILIZING A 35cc GLASS BULB

1.0 PURPOSE:

1.1 To provide instructions for obtaining and analyzing a sample of gas or air to determine the identity and concentration of gamma emitting noble gases.

1.2 To provide instructions for collecting and counting of high activity noble gas samples utilizing a 35 cc glass bulb.

2.0 REFERENCES:

2.1 RD-1.2

2.2 RD-6

2.3 HP-1.4

2.4 HP-11.6

3.0 PRINCIPLE:

3.1 The atmosphere to be analyzed is drawn through a 35 cc glass bulb. The sample is contained in the bulb by closing the stopcocks. The glass bulbs can be of two styles - with or without a side arm. Should the gas sample prove to be too high in radiogas concentrations, an aliquot can be removed from one glass bulb through the side arm with a calibrated syringe and placed into another 35 cc glass bulb to provide the same counting geometry for a diluted sample.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 35 cc glass bulb.

4.2 Vacuum pump or siersat and sample tubing.

4.3 Radiogas data sheet for 35 cc glass bulb (attached).

4.4 Gamma Spectrometer.

4.5 Computer program.

5.0 PRECAUTIONS AND LIMIT VALUES:

5.1 Call the Control Room before drawing a containment air sample through the R-11/R-12 sample line. Ensure the R-11/R-12 sample line is aligned to sample containment air.

5.2 Protect the sampling devices from external contamination so that the counting equipment will not become contaminated.

5.3 Purge 35 cc glass bulb with clean air prior to use.

5.4 LLD for Xe-133 is ~ 1.0×10^{-5} μCi/cc for 1000 sec. count.

6.0 INSTRUCTIONS:

6.1 Connect a piece of tubing from sample point to one stopcock of 35 cc glass bulb if sampling a tank or remote area.

6.2 Connect a piece of tubing from other stopcock to suction side of pump or siersat if necessary.

6.3 Open stopcocks and start siersat or pump. Run pump for five minutes.

6.4 Stop siersat or pump, close stopcocks and disconnect 35 cc glass bulb from sampling point and pump.

6.5 Count on Ge(Li) detector.

6.6 Analyze data with computer program (+FX1111) or attached data sheet.

6.7 Use data in conjunction with appropriate procedure (RD-1.2, RD-6, HP-1.4).

Refer to HP-11.11
for Instructions

ATTACHMENT I

__________ GAS SAMPLING DATA SHEET

COUNTED IN 35 ml BULB AT 18 mm on Ge(Li) CRYSTAL

DATE: ______________ TIME: ______________ BY: ______________

(Mev, $T_{1/2}$)

(0.081, 5.27d.) Xe^{133} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (0.371)\ {*}(0.0136)\ (35)}$ = ______ µCi/cc

Time Sec | ABUND | EFF | cc

(0.1495, 4.4 hr) Kr^{85m} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (0.74)\ {*}(0.017)\ (35)}$ = ______ µCi/cc

(0.1639, 11.8d) Xe^{131m} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (.02)\ {*}(0.0155)\ (35)}$ = ______ µCi/cc

(0.196, 3.8L) Kr^{88} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (.35)\ {*}(0.0130)\ (35)}$ = ______ µCi/cc

(0.2328, 2.26d) Xe^{133m} = $\dfrac{(\qquad)}{(3.7 \times 10^4)\ (\quad)\ (0.14)\ {*}(0.0108)\ (35)}$ = ______ µCi/cc

(0.2486, 9.14 hr) Xe^{135} = $\dfrac{(\qquad)}{(3.7 \times 10^4)\ (\quad)\ (0.92)\ {*}(0.0101)\ (35)}$ = ______ µCi/cc

(0.258, 17m) Xe^{133} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (1.00)\ {*}(0.0098)\ (35)}$ = ______ µCi/cc

(0.403, 76 m) KR^{87} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (0.50)\ {*}(0.0062)\ (35)}$ = ______ µCi/cc

(0.514, 10.75 yr) Kr^{85} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (0.080)\ {*}(0.00485)\ (35)}$ = ______ µCi/cc

(0.527, 15.6 m) Xe^{135m} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (0.080)\ {*}(0.0047)\ (35)}$ = ______ µCi/cc

(1.294, 1.83 hr) Ar^{41} = $\dfrac{\qquad}{(3.7 \times 10^4)\ (\quad)\ (0.99)\ {*}(0.0019)\ (35)}$ = ______ µCi/cc

Total Activity = ______ µCi/cc

* Efficiency is for Ge(Li) @ 18 mm. For other counting systems or geometries, check calibration sheets.

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. HP-11.4 REV. NO. 3

HIGH VOLUME AIR SAMPLING

TECHNICAL REVIEW

PORC. 2/05/79

TRSchuler 2/21/79
Q/C REVIEW DATE

APPROVED FOR USE

[signature] 2-22-79
PLANT SUPERINTENDENT DATE

QA X NON-QA ____ CATEGORY ____ THIS PROCEDURE CONTAINS 4 PAGES

LIFETIME ____ NONPERMANENT ____ REC. CENTRAL RECORDS DATE ____

REVIEWED BY ____ DATE ____ DISP. DATE ____

HP-11.4

HIGH VOLUME AIR SAMPLING

1.0 **PURPOSE:**

1.1 To measure the concentration of particulate airborn activity.

2.0 **REFERENCES:**

2.1 N/A

3.0 **PRINCIPLE:**

3.1 A high volume sample of air is collected and analyzed using filter paper as the collection device.

3.2 It is difficult to measure the concentration of airborne activity both quickly and accurately. Airborne activity in our operation results from activation and fission products. In practice, respirators are worn on the advice of the H.P. Surveyor based on his experience or when air monitoring indicates 1 X 10^{-7} uCi/cc of short-lived beta radioactivity or 3 X 10^{-9} uCi/cc of long-lived beta radioactivity.

3.3 The short-lived radioactivity measured is mainly due to the Rubidium 88 daughter of Krypton 88; it has an 18 minute half-life and implies noble gas fission products. RB 88 and Kr 88 have an MPC of 1 X 10^{-6} uCi/cc. Another contributor to short-lived beta are the particulate daughters from naturally occurring radon gas in the atmosphere. The particulate daughters have a half-life of 30 minutes and may be considered to be completely decayed after 4 hours. It is readily seen, therefore, that the measured air activity without regard to the decay time between sampling and counting will give highly variable results.

4.0 **PREREQUISITES AND NEEDED EQUIPMENT OR REAGENTS:**

4.1 Staplex high volume air sample Model TF1A

4.2 Filter paper type #2133 or equivalent

4.3 Air activity calculation and record sheet

4.4 Beta counting system

4.5 Gamma counting system for isotopic analysis if required

5.0 **PRECAUTIONS AND LIMIT VALUES:**

5.1 When using TFA #2133 filter paper, the flow rate should be approximately 36 cfm. If it is not, the unit should be brought in and flow rated checked.

5.2 Unidentified MPC for long-lived beta activity is 3×10^{-9} μci/cc.

5.3 If immediate analysis is required the filter should be counted by gamma analysis to identify all gamma emitters. After the appropriate decay times alpha and beta analysis can be performed to check the preliminary results.

6.0 INSTRUCTIONS:

6.1 Insert a 4 inch filter paper (Staplex #2133) on a high volume air sampler.

6.2 Record start time and initial flow rate.

6.3 After at least 300 ft^3 of air has been sampled record final flow and stop time.

6.4 For beta activity count on WB-L in a deep stainless planchet.

6.4.1 Unless an immediate analysis is necessary a 4 hr. decay should be allowed to minimize interference from short lived and naturally occurring radionuclides.

6.5 For gamma analysis punch out a 1 7/8" diameter portion of the sample and place in a planchet.

6.6 Count on the GeLi at 18mm

6.7 The ratio of the effective filtering area (3.5" Dia.) to the sample portion area (1 7/8" Dia.) is 3.5. This factor must be applied to the gamma results.

6.8 Alpha counting may be done on the 1 7/8" sample portion in the I.P.C. or on the whole filter in the WB-L.

6.8.1 A 24 Hr. decay should be allowed to minimize interference from naturally occurring radionuclides.

6.9 Record all data on attached calculation sheets.

Refer to HP-11.4
for Instructions

HIGH VOLUME AIR SAMPLE CALCULATIONS

LOCATION: ______________________ DATE: ______________

WORK IN PROGRESS: ________________ WORK PERMIT: __________

TIME ON: __________ FLOW: ________CFM

TIME OFF: __________ FLOW: ________CFM

MIN. SAMPLED: ________ AVG. FLOW: ______CFM

(MIN. SAMPLED ________ X (AVG. FLOW) ________ X 28317 = ________cc

1 7/8" diameter sample portion counted 18 mm from GeLi crystal. If computer print out is obtained attach to this sheet.

Hand gamma activity calculation

Isotope $= \dfrac{(\quad - \quad)(3.5)}{(\quad)_{time}(\quad)_{eff}(\quad)_{abun}(37000)(\quad)_{vol}}$ = ________µci/cc

$= \dfrac{(\quad - \quad)(3.5)}{(\quad)_{time}(\quad)_{eff}(\quad)_{abun}(37000)(\quad)_{vol}}$ = ________µci/cc

$= \dfrac{(\quad - \quad)(3.5)}{(\quad)_{time}(\quad)_{eff}(\quad)_{abun}(37000)(\quad)_{vol}}$ = ________µci/cc

$= \dfrac{(\quad - \quad)(3.5)}{(\quad)_{time}(\quad)_{eff}(\quad)_{abun}(37000)(\quad)_{vol}}$ = ________µci/cc

$= \dfrac{(\quad - \quad)(3.5)}{(\quad)_{time}(\quad)_{eff}(\quad)_{abun}(37000)(\quad)_{vol}}$ = ________µci/cc

Total Ident. Gamma Act = ________µci/cc

Gross Beta Act $= \dfrac{(\underset{cpm}{\quad} - \underset{cpm}{\quad})(\quad)}{(\quad)_{eff}(2.22 \times E6)_{dpm/\mu ci}(\quad)_{vol}}$ = ________µci/cc
Decay time ______

Gross Alpha Act $= \dfrac{(\underset{cpm}{\quad} - \underset{cpm}{\quad})(\quad)}{(\quad)_{eff}(2.22 \times E6)_{dpm/\mu ci}(\quad)_{vol}}$ = ________µci/cc
Decay time ______

ANALYST: ________________ CHECKED BY: ________________

Refer to HP-11.4
for Instructions

MIXED MPC CALCULATIONS FOR

40 HOURS AIR ACTIVITY

DATE: ____________________

SWP Ø: ____________________

TOTAL ISOTOPIC: ______________ µci/cc

MIXED MPC: ______________ µci/cc

GROSS BETA: ______________ µci/cc

$$\text{MIXED MPC } (\mu\text{Ci/cc}) = \frac{\text{TOTAL ACTIVITY } (\mu\text{ci/cc})}{\Sigma\ C/MPC}$$

$$\text{MPC} = \frac{\text{TOTAL ACTIVITY}}{\begin{array}{l} \frac{\_\_\_\_}{1E-8\ (CE\text{-}144)} + \frac{\_\_\_\_}{2E-7\ (Ce\text{-}141)} + \frac{\_\_\_\_}{8E-7\ (Np\text{-}239)} + \frac{\_\_\_\_}{2E-6\ (Cr^{51})} + \frac{\_\_\_\_}{9E-9\ (I\text{-}131)} + \\ \frac{\_\_\_\_}{8E-8\ (Ru\text{-}103)} + \frac{\_\_\_\_}{1E-8\ (Cs\text{-}134)} + \frac{\_\_\_\_}{1E-8\ (Cs\text{-}137)} + \frac{\_\_\_\_}{3E-8\ (Zr\text{-}95)} + \frac{\_\_\_\_}{1E-7\ (Nb\text{-}95)} + \\ \frac{\_\_\_\_}{5E-8\ (Co\text{-}58)} + \frac{\_\_\_\_}{4E-8\ (Mn\text{-}54)} + \frac{\_\_\_\_}{1E-7\ (Te\text{-}132)} + \frac{\_\_\_\_}{5E-8\ (Fe\text{-}59)} + \frac{\_\_\_\_}{9E-9\ (Co\text{-}60)} + \\ \frac{\_\_\_\_}{4E-8\ (Ba\text{-}La\text{-}140)} + \_\_\_\_ + \_\_\_\_ \end{array}}$$

$$\text{MIXED MPC} = \frac{\text{TOTAL ACTIVITY}}{(\Sigma\ \text{DENOMINATOR})} = \_\_\_\_\_\_\_\_$$

CALCULATED BY: ____________________

CHECKED BY: ____________________

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. HP-11.10 REV. NO. 2

AIR SAMPLING ~~WHEN~~ WITH SIERSAT LOW VOLUME AIR SAMPLES

TECHNICAL REVIEW

PORC 12/17/79

TRSchuler
QC REVIEW

1-14-80
DATE

APPROVED FOR USE

[signature]
PLANT SUPERINTENDENT

1-14-80
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ______________________

THIS PROCEDURE CONTAINS 4 PAGES

HP-11.10

AIR SAMPLING WITH SIERSAT LOW VOLUME AIR SAMPLES

1.0 PURPOSE:

1.1 To describe the steps necessary to sample air for iodine and/or particulate contamination with the Siersat Lapel Sampler.

2.0 REFERENCES:

2.1 PC-1.4

3.0 PRINCIPLE:

3.1 The Siersat Lapel Sampler is a low volume (breathing rate) air sampler normally used to ascertain the concentration of respirable airborne contaminants in the breathing zone. The sampler may be used for sampling particulate or iodine or both depending upon which head is attached. The volume of air is measured by a digital counter which displays the number of strokes taken by the diaphram pump.

4.0 PREREQUISITES AND NEEDED MATERIAL:

4.1 Siersat Lapel Sampler

4.2 Iodine and particulate sample head

4.3 Siersat particulate filter head

4.4 SAI CP-100 or equivalent charcoal iodine sampler

4.5 Gelman type A/E or equivalent glass fiber filter

4.6 Beta counting equipment

4.7 Gamma counting system

4.8 Siersat lapel sampler particulate and iodine data sheet

5.0 PRECAUTINS AND LIMIT VALUES:

5.1 Unidentified MPC for airborne long-lived beta radioactivity is 3×10^{-9} µci/cc.

5.2 Care should be taken when interpreting preliminary analysis of particulate contamination since short-lived isotopes may cause overestimation of airborne radioactivity.

5.3 The MPC for Iodine 131 is 9×10^{-9} µci/cc.

5.4 The MPC for unidentified alpha airborne radioactivity at Ginna is 2×10^{-12} µci/cc (Cm-248 not present).

6.0 INSTRUCTIONS:

6.1 Obtain Siersat pump and battery pack from HP Lab.

6.2 Select either particulate sample head or particulate and iodine sample head as required by the Work Permit.

6.3 Load sample head with glass fiber filter and/or charcoal iodine sampler.

6.4 If contamination of the sampler is possible, it may be wrapped in plastic tubing to allow for easier decontamination.

6.5 Turn the sampler on and off to check its operation.

6.6 Check calibration date to ensure flow readout has been calibrated within six months.

6.7 Record start number from sampler and indicate on side of sampler (use masking tape).

6.8 Place sampler intake in breathing zone or area called for on SWP.

6.8.1 Breathing zone sampling can be done by placing the equipment on an individual or on equipment in close proximity to worker's head.

6.8.2 Care should be taken when placing sampler to preclude contamination from non-airborne material.

6.9 Record start time and area sampled on sampler or initiate a "Siersat Lapel Sampler Particulate and Iodine Data Sheet".

6.10 Remove filter(s) and count for appropriate analyses.

NOTE: For significant results at least 10^5 of air should normally be sampled.

6.10.1 Particulate samples may be counted with the BC-4, IPC or GM top shelf. If no estimate of air activity is available, initial count should be by GM tube.

6.10.2 Iodine analysis of the charcoal is performed by removing charcoal from sampler, placing it in a 250 ml bottle, mixing and counting on Gamma Spectrometer System.

6.10.3 If an MPC calculation is necessary, the particulate filter should be placed in a planchet and counted on GeLi system.

6.10.4 If an immediate analysis is not necessary on the particulate sample, a 4 hr. decay may be allowed before counting.

6.10.5 Alpha counting should be performed after a 24 hr. decay on designated samples.

6.11 Calculate the activities on the data sheet.

6.12 Attach calculation sheets and computer printouts to applicable SWP's or if samples were taken on an RWP file in proper file.

6.13 Results may also be recorded on an "Air Activity Log Sheet".

Refer to HP-11.10
for Instructions

SIERSAT LAPEL SAMPLER PARTICULATE AND IODINE DATA SHEET

DATE: ____________________ SWP NO. ____________________

TIME OFF: VOLUME STOP:

TIME ON: START: ____________________

X (   ) = ________ cc

* See Note

$$\mu Ci/cc\ ^{131}I = \frac{[(\qquad - \qquad)]\,(\qquad)\,(\qquad)}{(\qquad)^{*}(.0053)\,(.82)\,(\qquad)\,(3.7 \times 10^4)} = \_\_\_\_\_\_$$

Decay Factors

Time Eff. Abund. Volume

$$\mu Ci/cc\ ^{133}I = \frac{(\qquad - \qquad)\,(\qquad)\,(\qquad)}{(\qquad)^{*}(.0038)\,(.89)\,(\qquad)\,(3.7 \times 10^4)} = \_\_\_\_\_\_$$

μCi/cc Gross Beta
Decay Time ______

$$= \frac{(\qquad - \qquad)}{(\qquad)\,(.\qquad)\,(\qquad)\,(2.22 \times 10^6)} = \_\_\_\_\_\_$$

Time Eff. Volume

μCi/cc Grosss Beta
Decay Time ______

$$= \frac{(\qquad - \qquad)}{(\qquad)\,(\qquad)\,(\qquad)\,(2.22 \times 10^6)} = \_\_\_\_\_\_$$

Time Eff. Volume

Sample Area: ____________________

Work in Progress: ____________________

Worn By: ____________________

Analyst: ____________________

Checked By: ____________________

* Efficiency is for GeLi at 18 mm. For other counting systems, check Calibration Sheets.

NOTE: Multiply difference in totalizer reading by the calibration factor on the sampler.

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. PC-4 REV. NO. 4

HYDROGEN CONCENTRATION AND RADIOGAS ACTIVITY

IN PRIMARY COOLANT SAMPLING AND ANALYSIS

TECHNICAL REVIEW

PORC 1/26/79

TRSchuler
Q/C REVIEW

2/15/79
DATE

APPROVED FOR USE

BruceASnow
PLANT SUPERINTENDENT

FEB 15 1979
DATE

QA X NON-QA ____ CATEGORY ____

LIFETIME ____ NONPERMANENT ____

REVIEWED BY ____ DATE ____

THIS PROCEDURE CONTAINS 9 PAGES

REC. CENTRAL RECORDS DATE ____

DISP. DATE ____

PC-4

HYDROGEN CONCENTRATION AND RADIOGAS ACTIVITY IN PRIMARY COOLANT SAMPLING AND ANALYSIS

1.0 PURPOSE:

1.1 To determine the dissolved hydrogen concentration and the dissolved noble and activation gas activity in the primary system. The dissolved hydrogen is necessary to recombine the water that is broken down after passing through the reactor core. The dissolved radiogas activity is necessary in determining the total activity and the average energy per disintegration (E) of the primary coolant.

2.0 REFERENCES:

2.1 Operating Instruction, S-5, Nuclear Sample Room Sampling System.

2.2 Radiochemical Procedures, WXAP-7278, Rev. 1, Jan. 1973.

2.3 Fisher Gas Partioner Model 25V, Instruction Manual

3.0 PRINCIPLE:

3.1 A pressurized primary sample is collected in a stainless steel vessel. The sample is connected to a gas sampling rig and depressurized, the gas evolving into an evacuated container. After all the gas has evolved, the evacuated container is brought to atmospheric pressure. A sample is drawn from the side port of the collector and injected into a gas partioner for dissolved hydrogen determination. Another sample is drawn from the side port of the collector and transferred to a gamma gas counting vial. The concentrations of all radiogas isotopes are determined by a gamma spectrometer. The radiogas activity is calculated as uCi/gram of primary coolant. The hydrogen concentration is calculates as cc of hydrogen/kilogram of primary coolant at STP.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 Steel collection bomb for pressurized sample.

4.2 Glass gas collection bulb with side port.

4.3 In-line vacuum pump and vacuum gauge

4.4 Fisher gas partioner, Model 25V, with column #2, Argon gas carrier, and strip chart recorder with 1 mv span and 1 inch/minute chart speed.

4.5 Hamilton gas tight syringe with Chaney Adapter, 1 ml., 5 ml.

4.6 Gas collection bulb, 35cc, with rubber septum. (Kontes Glass Co., #049314-0102, Septum # 774150-0375).

4.7 Gamma spectrometer

5.0 PRECAUTIONS AND LIMIT VALUES:

5/1 Make sure all connections are tight on the sample rig. A vacuum of about 30 inches (gauge reading) should be able to be drawn on the glass bulb.

5.2 The valves on the steel collection bomb should be tested occasionally for leakage by placing the pressurized bomb under water.

5.3 The gas tight syringes should be used as per operating instructions so as not to damage the plunger.

5.4 Samples containing large amounts of gas can blow out the stop cocks on the glass collection bulb when the pressure vessel is first cracked open.

5.5 Hold finger on top of syringe when injecting sample into the gas partitioner to prevent the back pressure of the carrier gas from blowing out the plunger.

5.6 Count all radiogas samples as soon as possible and minimize any possible leakage through the septum.

5.7 If any hydrogen or radiogas determinations are abnormally low, check system for leaks and resample.

5.8 Visually examine the spectrum to make sure all peaks are identified and accounted for when the isotopic concentrations are determined.

6.0 INSTRUCTIONS:

6.1 Sample preparation

6.1.1 Collect sample in the steel pressure vessel per Operating Instruction S-5. Dose rate from the pressure vessel should be checked.

6.1.2 Connect steel bomb to the gas sampling rig making sure the quick disconnects are lightly greased.

6.1.3 Close valves 1 and 3. Open valve 2 and stopcocks A & B. Valves 1A and 1B Closed.

6.1.4 Start the vacuum pump, and close stopcock A when the gauge reads approximately 30 inches. Stop vacuum pump.

6.1.5 Slowly crack valve 1A and allow gas to slowly evolve until valve is fully open.

6.1.6 If there is no visible gas bubbles after valve 1A has been open for 2-3 minutes, crack open valve 1B & 3 to maintain a very slow but steady flow of gas bubbles. If the bubbling stops, readjust Valve 3 and repeat until the valve is fully open.

6.1.7 Wait 2 - 3 minutes after all bubbling has stopped.

6.1.8 If there is any water in the glass bulb, carefully open stopcock A until water is drained, then close stopcocks A & B.

6.2 Hydrogen Determination

6.2.1 Set the gas partitioner on "Hi Cell Current" the sensitivity at 50%, and the Argon gas flow at 80 cc/min. A new column has to be purged until good separation of peaks can be obtained.

6.2.2 The thermal stabilizer air bath should be maintaining 50° to 60° C.

6.2.3 Turn the recorder full scale valve knob to "zero" position, set to measure and adjust pen to about 1 on the chart. Set full scale valve knob to 1 millivolt d.c. then adjust balance knob on the partioner until the pen is about 1 on the chart.

6.2.4 Set to "record" with 1 inch per minute chart speed.

6.2.5 Using a syringe, withdraw 1 ml from the sideport of the glass collection bulb and inject into a partitioner.

6.2.6 The order of appearance of the peaks will be, composite, hydrogen, oxygen, and nitrogen.

6.2.7 If the hydrogen peak goes off scale, repeat Step e using a lower sensitivity setting.

6.2.8 Set record to standby.

6.2.9 Determine the peak height, in chart divisions, of the hydrogen peak. Measure the peak height from the actual, observed base line.

6.2.10 Calculation:

$$\%\ H_2 \text{ by volume in sample} = \frac{\text{peak height sample}}{\text{peak height standard}} \times \%\ H_2 \text{ by volume in standard}$$

$$\frac{ccH_2}{\text{kg water}} = \frac{\%\ H2 \text{ by volume} \times \text{total gas volume}}{100 \times \text{kg water}}$$

Using a 1% H_2 standard, a total gas sample volume of 300 cc which evolved from 0.1 kg of water the formula becomes:

$$\frac{ccH_2}{\text{kg water}} = \frac{\text{peak height sample}}{\text{peak height standard*}} \times 30$$

*Use the peak height of the standard corresponding to the % sensitivity setting used in the analysis.

6.3 Radiogas determination

6.3.1 Using a 35 ml gamma gas counting vial with a rubber septum, and a syringe, draw from the vial a volume equivalent to the volume of sample to be injected, but not exceeding 10 cc.

6.4 Draw a sample from the side port of the glass collection bulb with a syringe and inject into the counting vial.

6.5 Determine the uCi/gram if each isotope identifiable using a gamma spectrometer and correcting for decay to 15 minutes after sampling using the following formula:

$$\frac{uCi}{gram} = \frac{\text{(peak counts - background counts) x decay factor x expansion factor}}{\text{(minutes counted) (cc of gas) (gamma abundance)(gamma eff)}(2.22 \times 10^6)}$$

6.5.1 Peak counts - total counts over full photopeak

6.5.2 Background counts - average the counts in the channel preceding the first peak channel in the counts in the channel following the last peak channel and multiply by the number of channels used for the peak.

6.5.3 Gamma abundance - gammas per disintegration from "Nuclear Date Tables", Volume 8, January 1971.

6.5.4 Gamma eff - the detector efficiency for the energy of the peak from the table or curve of energy versus efficiency for the calibration standard for the same geometry.

6.5.5 2.22×10^6 - dpm per microcurie. Use 3.7×10^4 dps per microcurie of count time is in seconds.

6.5.6 Decay factor - e $\frac{.693\ T}{T½}$, where T is the time elapsed starting from 15 minutes after sampling to the time the sample is counted. T½ is the half life.

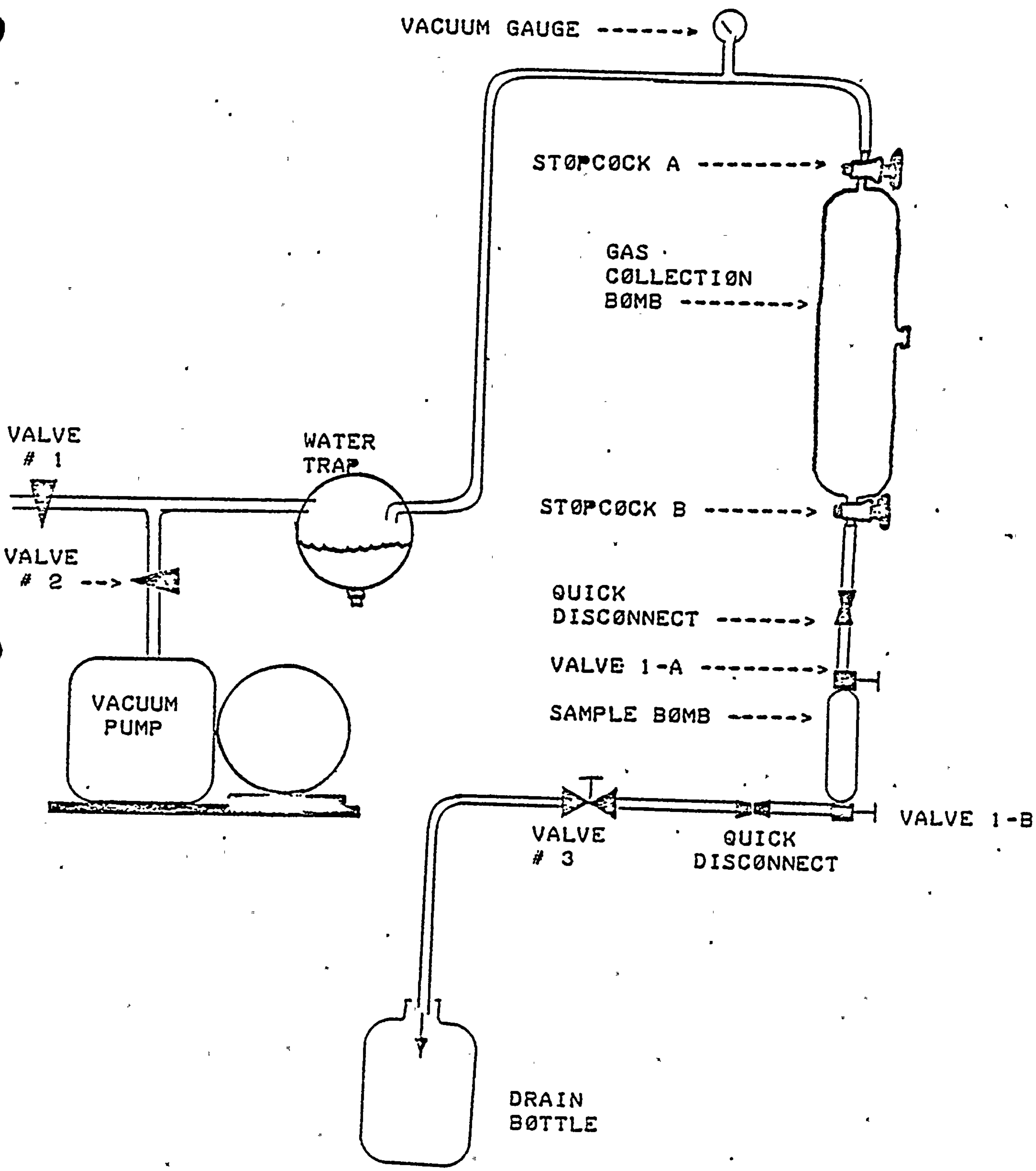
6.5.6 Expansion factor - the volume of the gas collector bulb divided by the volume of the steel bomb. For a 300 cc gas collector and a 100 cc bomb, the factor is 3.

6.5.7 Multiply the concentration in uCi/gram by a factor of 1.20 to correct for nay gas remaining in the liquid.

6.6 Enter the results in the Chemistry Log Book.

6.7 When all samples are finished, open valves 1, 3, 1A and 1B and stopcocks A & B on the sampling rig and allow liquid to drain into waste bottle.

PRIMARY SYSTEM GAS SAMPLING RIG.



Refer to PC-4
For Instructions

DATE: ______________

TIME: ______________

TIME OF COUNT: __________

B-LOOP GAS ACTIVITY

HAND CALCULATION SHEET

(Peak, T 1/2) For a 200 Sec. Count in 35cc bulb @ 18mm of GeLi with expansion factor of 3, 15 min decay, and a correction factor of 1.2.

(.0810, 126.48 hr.) Xe^{133} = $\frac{(9.58 \times 10^{-5}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

(.1495, 4.4 hr.) Kr^{85M} = $\frac{(4.02 \times 10^{-5}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

(.2496, 9.14 hr.) Xe^{135} = $\frac{(5.34 \times 10^{-5}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

(.4030; 1.27 hr.) Kr^{87} = $\frac{(1.80 \times 10^{-4}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

(.1961, 2.8 hr.) Kr^{88} = $\frac{(1.14 \times 10^{-4}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

(1.2936, 1.83 hr.) Ar^{41} = $\frac{(2.84 \times 10^{-4}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

(0.434, 17 Min) Xe^{138} = $\frac{(3.27 \times 10^{-4}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

(0.527, 15.6 Min) $Xe^{135}{}_m$ = $\frac{(2.52 \times 10^{-4}) \;(\quad - \quad)\;(\quad)}{(\quad cc)}$ = ______ uCi/gm

TOTAL GAS = ____________ uCi/gm

Rb^{88} = Kr^{88} Activity (   ) (0.59) = ____________ uCi/gm

CALCULATED BY: ______________________

CHECKED BY: ______________________

Refer to PC-4
for Instructions

GINNA STATION RADIOCHEMISTRY

B-LOOP GAS SAMPLE COUNTED @ 10 CM. ON NaI FLAT CRYSTAL

DATE:__________

GAS SAMPLE TIME:__________ GAS COUNT TIME:__________ KR-88:__________

MEV PEAK	T½	ISOTOPE			
0.081	126.48 Hr	XE-133	= $\frac{(\quad - \quad)(\quad)(3)(1.2)}{(\quad)(1.0)(.0205)(0.35)(2220000)}$ cc Min.		_____ uCi/gm
0.15	4.40 Hr	KR-85M	= $\frac{(\quad - \quad)(\quad)(3)(1.2)}{(\quad)(1.0)(.0172)(0.74)(2220000)}$	=	_____ uCi/gm
0.25	9.14 Hr	XE-135	= $\frac{(\quad - \quad)(\quad)(3)(1.2)}{(\quad)(1.0)(.0146)(0.92)(2220000)}$	=	_____ uCi/gm
	0.26 Hr	XE-135M	= I-135 Activity ( ) (0.157)	=	_____ uCi/gm
0.40	1.27 Hr	KR-87	= $\frac{(\quad - \quad)(\quad)(3)(1.2)}{(\quad)(1.0)(.0117)(0.50)(2220000)}$	=	_____ uCi/gm
0.196	2.80 Hr	KR-88	= $\frac{(\quad - \quad)(\quad)(3)(1.2)}{(\quad)(1.0)(.0158)(0.35)(2220000)}$	=	_____ uCi/gm
0.434	17.0 Min	Xe-138	= $\frac{(\quad - \quad)(\quad)(3)(1.2)}{(\quad)(1.0)(0.0111)(0.48)(2220000)}$	=	_____ uCi/gm
1.294	1.83 Hr	Ar-41	= $\frac{(\quad - \quad)(\quad)(3)(1.2)}{(\quad)(1.0)(0.0022)(0.99)(2220000)}$	=	_____ uCi/gm
			TOTAL GAS ACTIVITY	=	_____ uCi/gm
0.898	0.295 Hr	RB-88	= KR-88 Activity ( ) (0.59)	=	_____ uCi/gm

Decay Factor = $\frac{(0.693 \text{ Decay Factor})}{(\text{Half Life})}$

Calculated By:__________

Checked By:__________

Refer to PC-4
for Instructions

GINNA STATION RADIOCHEMISTRY

B-LOOP GAS SAMPLE COUNTED IN WELL CRYSTAL

DATE:______________

GAS SAMPLE TIME:______________ GAS COUNT TIME:__________ KR-88 COUNT TIME:______
DECAY TIMES (STARTING 15 MIN AFTER SAMPLE) GAS:_________ KR-88_________________

MEV PEAK	T½	ISOTOPE				
0.081	126.48 Hr	Xe-133	=	(-) ( ) (3) (1.2) / ( ) (1.0) (0.63) (0.35)(2220000) cc Min.		______uCi/gm
0.15	4.40 Hr	Kr-85M	=	(-) ( ) (3) (1.2) / ( ) (1.0) (0.71) (0.74)(2220000)	=	______uCi/gm
0.25	9.14 Hr	Xe-135	=	(-) ( ) (3) (1.2) / ( ) (1.0) (0.575) (0.92)(2220000)	=	______uCi/gm
	0.26 Hr	Xe-135M	=	I-135 Activity ( ) (0.157)	=	______uCi/gm
0.40	1.27 Hr	Kr-87	=	(-) ( ) (3) (1.2) / ( ) (1.0) (0.410) (0.50) (2220000)	=	______uCi/gm
0.196	2.80 Hr	Kr-88	=	(-) ( ) (3) (1.2) / ( ) (1.0) (0.0076) (0.35)(2220000)	=	______uCi/gm
0.434	17.0 Min	Xe-138	=	(-) ( ) (3) (1.2) / ( ) (1.0) (0.375) (0.48)(2220000)	=	______uCi/gm
1.294	1.83 Hr	Ar-41	=	(-) ( ) (3) (1.2) / ( ) (1.0) (0.070) (0.99)(2220000)	=	______uCi/gm
				TOTAL GAS ACTIVITY	=	______uCi/gm
0.898	0.295 Hr	Rb-88	=	KR-88 Activity ( ) (0.59)	=	______uCi/gm

Decay Factor = $\dfrac{(0.693)\ \text{Decay Factor})}{(\text{Half Life})}$

Calculated By:__________________

Checked By:__________________

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 7

PROCEDURE NO. PC-14 REV. NO. 3

POTENTIOMETRIC DETERMINATION OF BORON

TECHNICAL REVIEW

PORC 2-11-80

TRSchuler
QC REVIEW

2-25-80
DATE

APPROVED FOR USE

Bruce A Snow
PLANT SUPERINTENDENT

2-26-80
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 2 PAGES

PC-14

POTENTIOMETRIC DETERMINATION OF BORON

1.0 PURPOSE:

1.1 To determine the boron concentration in pure water.

2.0 REFERENCES:

2.1 APHA Methods Method 107C

2.2 Westinghouse WCAP-7333

2.3 Plant Operating Instruction, 0-6.5.

3.0 PRINCIPLE:

3.1 When a dilute solution of boric acid or borate is neutralized and then treated with mannitol, a complex acid is formed which can be titrated with dilute NaOH. The amount of boron is proportional to the amount of NaOH needed to return the pH of the solution to the reference pH.

4.0 PREREQUISITES AND NEEDED EQUIPMENT OR REAGENTS:

4.1 A pH meter and electrodes.

4.2 A microburet.

4.3 Standardized 0.100N NaOH (such as Fisher Certified 0.1N NaOH)

4.4 Mannitol (Mannite)

4.5 Titration Vessel

4.6 pH 7 buffer

4.7 Magnetic Stirrer

4.8 1N H_2SO_4

5.0 PRECAUTIONS AND LIMIT CONCENTRATIONS:

5.1 For low level Boron ($\lesssim$ 500 ppm) the absorption of CO_2 can be an interference. The use of a blank and rapid titration will minimize this. Phosphates in concentrations > 10 ppm will interfere and should be removed.

5.2 The standard NaOH should be protected from CO_2 absorption with a column of ascarite.

5.3 The limit for change in Boron conc between 2 full power steady state samples of the primary loop is 30 ppm. (See Procedure 0-6.5)

5.4 For good accuracy the sample sizes should be varied as follows:

5.5

Approximate Boron Concentration	Sample Aliquot
200 - 3500 ppm	5 ml
50 - 200 ppm	10 ml
0 - 50 ppm	100 ml
4 - 12%	Dilute 1:20 and use 5 ml

6.0 <u>INSTRUCTIONS:</u>

6.1 Place appropriate sized sample in a beaker and measure initial pH at 25°C ± 2°C.

6.2 Add about 1g of mannitol to the solution and titrate with 0.1N NaOH until approaching a pH of 8.5. Then add an excess of mannitol and continue to titrate to the 8.5 endpoint.

6.3 A blank should be determined on samples > 10 ml using D.I. water.

6.4 Calculate boron concentration as follows:

$$\text{ppm Boron} = \frac{(\text{ml NaOH})\ (\text{N NaOH})(10.82 \times 10^3)\ (\text{dilution factor})(\text{Buret correction factor})}{(\text{Sample Volume in ml})}$$

$$\%\ \text{Boric Acid} = \frac{\text{ppm B}}{1750}$$

GINNA STATION
UNIT #1
COMPLETED

DATE:

TIME:

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. PC-18.1 REV. NO. 1

CHLORIDE DETERMINATION

TECHNICAL REVIEW

PORC 8/14/78

Q/C REVIEW — DATE 8-25-78

APPROVED FOR USE

PLANT SUPERINTENDENT — DATE AUG 25 1978

QA 6 NON-QA ______ CATEGORY ______

THIS PROCEDURE CONTAINS 2 PAGES

LIFETIME ______ NONPERMANENT ______

REC. CENTRAL RECORDS DATE ______

REVIEWED BY ______ DATE ______

DISP. DATE ______

PC-18.1

CHLORIDE DETERMINATION

1.0 PURPOSE:

1.1 To determine the concentration of chloride in water.

2.0 REFERENCES:

2.1 ASTM Method 512C

2.2 Tech. Spec. 3.1.6

3.0 PRINCIPLE:

3.1 Solutions of ferric ammonium sulfate and mercuric thiocyanate are added to the sample. The chloride ion reacts with the mercuric thiocyanate to produce thiocyanate ion which in turn combines with ferric ion to form red ferric thiocyanate. The intensity of the color, which is proportional to the concentration of the chloride ion, is measured photometrically at a wavelength of 463 nm.

4.0 PREREQUISITES AND NEEDED EQUIPMENT OR REAGENTS:

4.1 A spectrophotometer for use at 463 nm wavelength.

4.2 Ferric Alum Solution:

4.2.1 Dissolve 5.0 g of ferrous ammonium sulfate, $Fe(NH_4)_2(SO_4)_2 \cdot 6H_2O$ in 20 ml of H_2O. Add 38 ml of conc. HNO_3, boil for 10 minutes and dilute to 100 ml when cool. Store in an amber bottle.

4.3 Mercuric Thiocyanate:

4.3.1 Dissolve 0.30 g mercuric thiocyanate $Hg(SCN)_2$ in 100 ml of methanol and store in amber bottle. Let stand 24 hrs. before using. Do not use if more than 4 weeks old.

5.0 PRECAUTIONS:

5.1 Bromides, iodides, cyanides, thiosulfates, and nitrates will interfere with this method. All glassware should be cleaned in hot 1:20 HNO_3. The concentration limits which may be determined directly are from 0.05 - 4.5 ppm. The limit in primary coolant is 0.15 ppm.

5.2 All changes in this procedure should be reflected in WC-7.0.

6.0 <u>INSTRUCTIONS:</u>

6.1 Measure a 25 ml sample into a poly bottle.

6.2 Add 5 ml of ferric alum solution and 3 ml of mercuric thiocyanate solution.

6.3 After 10 minutes read per cent transmission against a reagent blank at 463 nm wavelength.

6.4 Determine chloride concentration from the proper calibration curve.

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

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GINNA STATION
UNIT #1
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DATE:-

TIME:-

PROCEDURE NO. PC-23.1 REV. NO. 1

EMERGENCY SAMPLING OF PRIMARY COOLANT

TECHNICAL REVIEW

PORC 1-21-80

TRSchulu
QC REVIEW

1-28-80
DATE

APPROVED FOR USE

PLANT SUPERINTENDENT

1-28-80
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 7 PAGES

PC-23.1

EMERGENCY SAMPLING OF PRIMARY COOLANT

1.0 PURPOSE:

1.1 This procedure is to be used for sampling the primary system after the activation of the safety injection system to determine the dissolved Hydrogen concentration, the dissolved noble gas activity and the presence of any gamma emitting isotopes.

1.2 An event which activates the safety injection system could involve potential damage to the fuel in the core. The primary water could contain highly radioactive materials and the radiation from sampling lines would necessitate precautions not normally required for the taking and treatment of samples.

2.0 REFERENCES:

2.1 Operating Instruction, S-5, Nuclear Sample Room Sampling System

2.2 Radiochemical procedures, WCAP-7278, Rev. 1, Jan. 1973

2.3 Fisher Gas Partioner Model 25V, Instruction Manual

2.4 Hamilton gas tight syringe Instruction Manual

3.0 PRINCIPLE:

3.1 A pressurized primary sample is collected in a stainless steel vessel. The sample is connected to a gas sampling rig and depressurized, the gas evolving into an evacuated container. After all the gas has evolved, the evacuated container is brought to atmospheric pressure. A sample is drawn from the side port of the collector and injected into a gas partioner for dissolved hydrogen determination. Another sample is drawn from the side port of the collector and transferred to a gamma gas counting vial. The concentrations of all radiogas isotopes are determined by a gamma spectrometer. The radiogas activity is calculated as μCi/gram of primary coolant. The hydrogen concentration is calculated as cc of hydrogen/kilogram of primary coolant at STP.

3.2 The water is drained from the stainless steel sample bomb and diluted to an activity concentration that can be handled safely and counted on available equipment to determine the degree of damage to the core.

3.3 Shielding is used to reduce the radiation dose and proper dosimetry is used to determine whole body and extremity doses.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 Steel collection bomb for pressurized sample (volume will be marked on bomb).

4.2 Glass gas collection bulb with side port, 300 cc.

4.3 In-line vacuum pump and vacuum gauge.

4.4 Fisher gas partioner, Model 25V, with column #2, Argon gas carrier, and strip chart recorder with 1 mv span and 1 inch/minute chart speed.

4.5 Hamilton gas tight syringe with Chaney Adapter, 1 ml., 5 ml.

4.6 Gas collection bulb, 35 cc, with rubber septum. (Kontes Glass Co., #049314-0102, Septum # 774150-0375).

4.7 1000 ml Volumetric Flask

4.8 Pipets 250 µg, 500 µg, 1000 µg

4.9 Beakers

4.10 450 ml counting bottle

4.11 Ring Stand

4.12 Scott Airpack

4.13 Siersat air sampling apparatus for particulate and iodine

5.0 <u>PRECAUTIONS AND LIMIT VALUES:</u>

5.1 Respiratory protection may be required for the collection and handling of the samples.

5.2 Each liquid transfer will need special precaution to minimize cross contamination during dilution steps.

5.3 Each sampling step must be done in an operating hood to minimize air activity.

5.4 Move lead shielding into sampling area before opening any valves.

5.5 Make sure all connections are tight on the sample rig. A vacuum of about 30 inches (gauge reading) should be able to be drawn on the glass bulb.

5.6 The valves on the steel collection bomb should be tested before use for leakage by placing the pressurized bomb under water (use compressed air or Nitrogen).

5.7 The gas tight syringes should be used as per operating instructions so as not to damage the plunger.

5.8 Care should be taken to crack open valves slowly as sample containing large amounts of gas can blow out the stop cocks on the glass collection bulb when the pressure vessel is first cracked open.

5.9 Hold finger on top of syringe when injecting sample into the gas partitioner to prevent the back pressure of the carrier gas from blowing out the plunger.

5.10 Count all radiogas samples as soon as possible and minimize any possible leakage through the septum.

5.11 Check radiation field frequently while drawing sample.

6.0 INSTRUCTIONS:

6.1 Check with Control Room to determine if the letdown system is in operation.

6.1.1 If letdown system is in operation obtain reading from R-9 for dose rate. This will indicate if core damage has occurred and indicate possible dose rate to expect from the sample.

6.1.2 If letdown system is in operation and R-9 indicates a large increase in dose rate, a Scott Airpack will be used.

6.1.3 If letdown system is in operation and R-9 indicates no increase, an air sample will be taken while sampling.

6.1.4 If letdown system is not in operation, an air sample will be taken and a Scott air pack will be worn.

6.2 Check sample area for radiation level before collection of sample. Calculate time allowed to be in area if radiation levels are high.

6.3 Move necessary equipment into sample area - Fisher Gas Partitioner, Argon gas and recorder; two 1000 ml volumetric flasks nearly filled; pipets and beakers; evacuated gas collection bulb.

6.4 Place shielding material between front of sample hood and valve connections to minimize exposure while collecting sample and diluting to volume.

6.5 Dissolved Gas Analysis

6.5.1 Mount the gas collection bulb, which has been evacuated in the lab, behind the shield.

6.5.2 Connect special small volume stainless steel pressure vessel in place and collect sample per operating procedure S-5.

6.5.3 Monitor radiation levels and leave area if they become excessive.

6.5.4 Connect the steel bomb to the gas collection bulb and place beaker under bomb to collect any drips.

6.5.5 Open stopcock B (see Figure 1). Slowly crack valve 1A and allow gas to slowly evolve until valve is fully open.

6.5.6 After valve 1A has been open for a minute slowly open valve 1B and allow air to bubble through the sample bomb. Continue until the valve is fully open. Close all valves when atmospheric equilibrium is reached.

6.5.7 Hydrogen Determination

6.5.7.1 Set the gas partitioner on "Hi Cell Current" the sensitivity at 50%, and the Argon gas flow at 80 cc/min. A new column has to be purged until good separation of peaks can be obtained. Determine that gas flow from the partitioner is not into the room but into the hood.

6.5.7.2 The thermal stabilizer air bath should be maintaining 50° to 60° C.

6.5.7.3 Turn the recorder full scale valve knob to "zero" position, set to measure and adjust pen to about 1 on the chart. Set full scale valve knob to 1 millivolt d.c. then adjust balance knob on the partitioner until the pen is about 1 on the chart.

6.5.7.4 Set to "record" with 1 inch per minute chart speed.

6.5.7.5 Using a syringe, withdraw 1 ml from the sideport of the glass collection bulb and inject into partitioner.

6.5.7.6 The order of appearance of the peaks will be, composite, hydrogen, oxygen, and nitrogen.

6.5.7.7 If the hydrogen peak goes off scale, repeat Step 6.4.7.5 using a lower sensitivity setting.

6.5.7.8 Set recorder to standby.

6.5.7.9 Determine the peak height, in chart divisions, of the hydrogen peak. Measure the peak height from the actual observed base line.

6.5.7.10 Calculation:

6.5.7.10.1 $$\%\ H_2 \text{ by volume in sample} = \frac{\text{peak height sample}}{\text{peak height standard}} \times \%\ H_2 \text{ by volume in standard}$$

6.5.7.10.2 $$\frac{ccH_2}{\text{kg water}} = \frac{\%\ H_2 \text{ by volume} \times \text{total gas volume}}{100 \times \text{kg water}}$$

6.5.7.10.3 Using a 1% H_2 standard, a total gas sample volume of 300 cc which evolved from 0.002 kg of water the formula becomes:

6.5.7.10.4 $$\frac{ccH_2}{\text{kg water}} = \frac{\text{peak height sample}}{\text{peak height standard *}} \times 1500$$

* Use the peak height of the standard corresponding to the % sensitivity setting used in the analysis.

6.5.7.11 Enter the results in the Chemistry Log Book.

6.5.8 Radiogas determination

6.5.8.1 Draw a sample from the side port of the glass collection bulb with a syringe and inject into the counting vial. The sample size will be dependent on the activity in the gas collection bottle and should be less than 1 cc.

6.5.8.2 Determine the μCi/gram of each isotope identifiable using a gamma spectrometer and correcting for decay using the following formula:

6.5.8.3 $$\frac{\mu Ci}{gram} = \frac{(\text{peak counts} - \text{background counts}) \times \text{decay factor} \times \text{expansion factor}}{(\text{minutes counted})(\text{cc of gas})(\text{gamma abundance})(\text{gamma eff})(2.22 \times 10^6)}$$

6.5.8.3.1 Peak counts - total counts over full photopeak

6.5.8.3.2 Background counts - average the counts in the channel preceding the first peak channel and the counts in the channel following the last peak channel and multiply by the number of channels used for the peak.

6.5.8.3.3 Gamma abundance - gammas per disintegration from "Nuclear Data Tables", Volume 8, January 1971.

6.5.8.3.4 Gamma eff - the detector efficiency for the energy of the peak from the table or curve of energy versus efficiency for the calibration standard for the same geometry.

6.5.8.3.5 2.22×10^6 - dpm per microcurie. Use 3.7×10^4 dps per microcurie if count time is in seconds.

6.5.8.3.6 Decay factor = $e^{\frac{.693\,T}{T_{1/2}}}$, where T is the time elapsed after sampling to the time the sample is counted. $T_{1/2}$ is the half life.

6.5.8.3.7 Expansion factor - the volume of the gas collector bulb divided by the volume of the steel bomb. For a 300 cc gas collector and a 100 cc bomb, the factor is 3.

6.5.8.3.8 Multiply the concentration in μCi/gram by a factor of 1.20 to correct for any gas remaining in the liquid.

6.5.8.4 Enter the results in the Chemistry Log Book.

6.6 Liquid Sample

6.6.1 Disconnect gas collection bulb from sample bomb.

6.6.2 Open valve 1B and then valve 1A and drain the liquid into a beaker.

6.6.3 Pipet a 1 ml or smaller sample into a 1 liter volumetric flask and dilute to volume, stopper and agitate for mixing by inverting the flask repeatedly.

6.6.4 If further dilution is necessary, pipet 1 ml or larger appropriate volume from the flask into another 1 liter volumetric flask and dilute to volume. Stopper and agitate for mixing by inverting the flask repeatedly.

6.6.5 Pipet 1 ml or larger appropriate volume into a 450 ml counting bottle and count on a gamma spectrometer.

6.6.6 Determine the μCi/gram of each isotope identified using the gamma spectrometer, correcting for decay, using the following formula:

6.6.6.1 $$\frac{\mu Ci}{gram} = \frac{\text{(peak counts - background counts) x decay factor}}{\text{(seconds counted)(ml)(gamma abundance)(gamm eff.)}(3.7 \times 10^4)}$$

6.6.6.2 Peak Counts - total counts over full photopeak

6.6.6.3 Background Counts - average the counts in the channel preceding the first peak channel and the counts in the channel following the last peak channel and multiply by the number of channels used for the peak.

6.6.6.4 Gamma Abundance - gammas per disintegration from "Nuclear Data Tables", Volume 8, January 1971.

6.6.6.5 Gamma eff. - the detector efficiency for the energy of the peak from the table or curve of energy versus efficiency for the calibration standard in the same geometry.

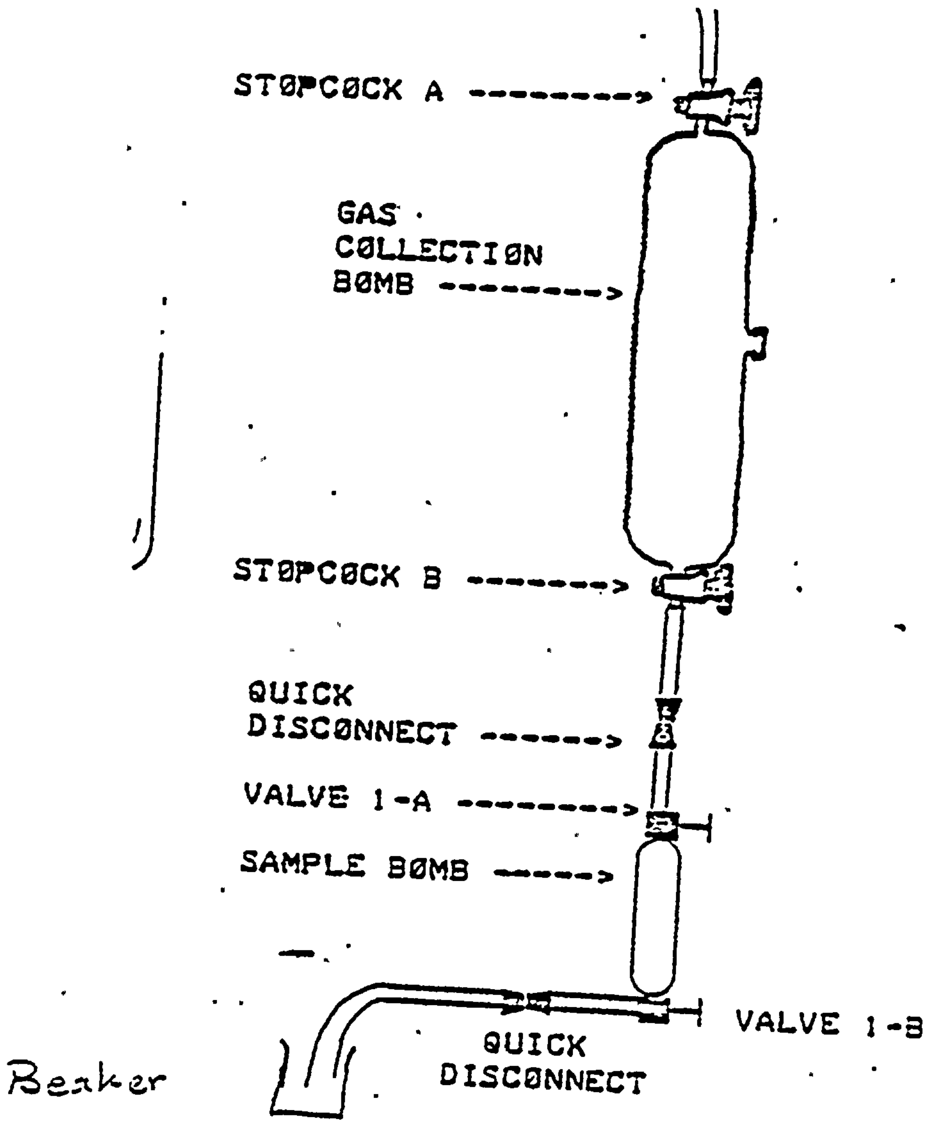
6.6.6.6 3.7×10^4 - dps per microcurie. Use 3.7×10^4 dps per microcurie if count time is in seconds, or use 2.22×10^6 dpm per microcurie if count time is in minutes.

6.6.6.7 Decay Factor - $e^{\frac{.693t}{T_{1/2}}}$, where t is the time elapsed from sampling to the time the sample is counted. $T_{1/2}$ is the half life.

6.6.7 Enter results in the Chemistry Log Book.

6.7 Dispose of samples in an approved manner based on their activity.

6.8 Calculate the results using the calculation sheets from Procedures PC-4 and PC-5.


STOPCOCK A
GAS COLLECTION BOMB
STOPCOCK B
QUICK DISCONNECT
VALVE 1-A
SAMPLE BOMB
VALVE 1-B
QUICK DISCONNECT
Beaker

GINNA STATION
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PROCEDURE NO. PC-23.2 REV. NO. 0

CONTAINMENT ATMOSPHERE SAMPLING AND ANALYSIS DURING CONTAINMENT ISOLATION

TECHNICAL REVIEW

PORC 12/27/79

Mark Shaw
QC REVIEW

12/29/79
DATE

APPROVED FOR USE

Bruce Snow MS
PLANT SUPERINTENDENT

12/29/79
DATE

QA X NON-QA ______ CATEGORY 1.0

REVIEWED BY: ____________________

THIS PROCEDURE CONTAINS 5 PAGES

PC-23.2

CONTAINMENT ATMOSPHERE SAMPLING AND ANALYSIS DURING CONTAINMENT ISOLATION

1.0 PURPOSE:

1.1 To determine the concentration of radiogas in the containment air after a containment isolation.

2.0 REFERENCES:

2.1 PC-4, Hydrogen Concentration and Radiogas Activity in Primary Coolant

2.2 HP-11.10, Air Sampling With Siersat

3.0 PRINCIPLE:

3.1 A sample of the containment atmosphere is collected and analyzed to determine the concentrations of all radiogas isotopes.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 Gas collection bulb, 35 cc with side arm port.

4.2 Gast pump to pull sample from containment and return.

4.3 Keys for locks on valves.

4.4 Electrical Extension Cord.

4.5 A Survey Meter.

4.6 Siersat Air Sampler.

5.0 PRECAUTIONS AND LIMIT VALUES:

5.1 Purge sample collection device with clean air before use.

5.2 The concentration of Xe^{133} cannot exceed 1.0×10^{-2} μCi/cc if the containment is to be purged with one fan at the design flow rate of 12500 cfm.

5.3 Use proper dosimetry and extremity badges.

6.0 INSTRUCTIONS:

6.1 Obtain R-12 reading from the Control Room.

6.2 Obtain a 35 cc gas bulb and purge with clean air.

6.3 There are three available sample points that could be used.

6.3.1 Penetration 124 located in Auxiliary Building Intermediate Level behind Refueling Water Storage Tank.

6.3.2 Penetration 203 located in Intermediate Building inside sample valve cubicle against containment wall.

6.3.3 Penetration 305 located in Intermediate Building North, basement level east of S/G Blowdown valves.

6.4 Notify Control Room when you are ready to sample and give the penetration location.

6.5 For personnel monitoring, obtain a Siersat sampler, and take with you, set up for particulate and iodine.

7.0 When sample is taken at Penetration 124

7.1 Connect vacuum pump and 35 cc collection bulb between valves 1570 and 1573 the suction side of the pump on valve 1570.

7.2 Open valve 1569

7.3 Open valve 1570

7.4 Open valve 1573

7.5 Open valve 1572

7.6 Start pump and let run for at least 5 minutes monitoring sample.

7.7 Close stopcocks on glass bulb *

7.8 Stop pump.

7.9 Close valve 1572.

7.10 Close valve 1573.

7.11 Close valve 1570.

7.12 Close valve 1569.

7.13 Remove the sample collector and count using the attached calculation sheet.

8.0 When sample is taken at Penetration 203

8.1 Connect vacuum pump and 35 cc collection bulb between valves 1564 and 1567 the suction side of the pump on valve 1564.

8.2 Open valve 1563.

8.3 Open valve 1564.

8.4 Open valve 1567.

8.5 Open valve 1566.

8.6 Start pump and let run for at least 5 minutes monitoring sample.

8.7 Close stopcocks on glass bulb *

8.8 Stop pump.

8.9 Close valve 1566.

8.10 Close valve 1567.

8.11 Close valve 1564.

8.12 Close valve 1563.

8.13 Remove the sample collector and count using the attached calculation sheet.

9.0 When sample is taken at Penetration 305 there are two available sample points.

9.1 For D Fan connect vacuum pump and 35 cc collection bulb between valves 1555 and 1561 the suction side of the pump on valve 1555.

9.2 Open valve 1554.

9.3 Open valve 1555.

9.4 Open valve 1561.

9.5 Open valve 1560.

9.6 Start pump and let run for at least 5 minutes monitoring sample.

9.7 Close stopcocks on glass bulb *

9.8 Stop pump.

9.9 Close valve 1560.

9.10 Close valve 1561.

9.11 Close valve 1555.

9.12 Close valve 1554.

9.13 Remove the sample collector and count using the attached calculation sheet.

10.0 Sample from A Fan Penetration 305

10.1 Connect vacuum pump and 35 cc collection bulb between valves 1558 and 1561 the suction side of the pump on valve 1558.

10.2 Open valve 1557.

10.3 Open valve 1558.

10.4 Open valve 1561.

10.5 Open valve 1560.

10.6 Start pump and let run for at least 5 minutes monitoring sample.

10.7 Close stopcocks on glass bulb *

10.8 Stop pump.

10.9 Close valve 1560.

10.10 Close valve 1561.

10.11 Close valve 1558.

10.12 Close valve 1557.

10.13 Remove the sample collector and count using the attached calculation sheet.

11.0 Dilution of the gas sample should be done using lead bricks for shielding.

11.1 If dose rate is > 1 R/hr. on collection bulb, dilute 1 ml to 35 ml in a second bulb.

11.2 Count diluted sample using attached calculation sheet.

* At this point remote handling of the sample may be necessary.

Refer to PC-23.2
for Instructions

ATTACHMENT I

______________________ SAMPLE (GAS)

COUNTED IN 35 ml BULB AT 18 mm

Date: ______________ Time: ______________ By: ____________________

(Mev. T 1/2)

(0.081, 5.27d.) $Xe^{133} = \dfrac{(\qquad)}{(3.7\times10\ )(\quad)(0.371)(0.0136)(35)}$ = ____________ µCi/cc

Time ABUND EFF cc
Sec

(0.1495, 4.4 hr) $Kr^{85m} = \dfrac{(\qquad)}{(3.7\times10\ )(\quad)(0.74)(0.017)(35)}$ = ____________ µCi/cc

(0.1639, 11.9d) $Xe^{131m} = \dfrac{(\qquad)}{(3.7\times10\ )(\quad)(.02)(0.0155)(35)}$ = ____________ µCi/cc

(0.2328, 2.26d) $Xe^{133m} = \dfrac{(\qquad)}{(3.7\times10\ )(\quad)(0.14)(0.0108)(35)}$ = ____________ µCi/cc

(0.2486, 9.14 hr) $Xe^{135} = \dfrac{(\qquad)}{(3.7\times10\ )(\quad)(0.92)(0.0101)(35)}$ = ____________ µCi/cc

(0.514, 10.76 yr) $Kr^{85} = \dfrac{(\qquad)}{(3.7\times10\ )(\quad)(0.0041)(0.0045)(35)}$ = ____________ µCi/cc

(1.294, 1.83 hr) $Ar^{41} = \dfrac{(\qquad)}{(3.7\times10\ )(\quad)(0.99)(0.0019)(35)}$ = ____________ µCi/cc

TOTAL GAS ACTIVITY ____________________ µCi/cc

Checked By ______________________________

GINNA STATION
UNIT #1
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DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 7

PROCEDURE NO. PC-23.3 REV. NO. 1

ESTIMATION OF NOBLE GAS RELEASE RATE FROM THE PLANT VENT

DURING ACCIDENT CONDITIONS

TECHNICAL REVIEW

PORC 2-19-80

TRSchuler
QC REVIEW

2-25-80
DATE

APPROVED FOR USE

Bruce A Snow
PLANT SUPERINTENDENT

2-26-80
DATE

QA ✓ NON-QA ______ CATEGORY 1.C

REVIEWED BY: ______________________

THIS PROCEDURE CONTAINS 4 PAGES

PC-23.3

ESTIMATION OF NOBLE GAS RELEASE RATE

FROM THE PLANT VENT DURING ACCIDENT CONDITIONS

1.0 PURPOSE:

1.1 The purpose of this procedure is to provide a method of estimating the release rate of noble gas from the plant vent when the normal monitor is off-scale high during an accident.

2.0 REFERENCES:

2.1 Radiological Health Handbook, USHEW, January 1970

2.2 Introduction to Health Physics, Cember, 1969, Pergamon Press

3.0 PRINCIPLE:

3.1 The dose rate from the plant vent is measured at a fixed distance and the vent is considered to be a line gamma source. Considering Xenon 133 to be the only isotope present in the vent and knowing the vent flow rate, the relationship between the dose rate R/hour and the release rate (curies/second) can be calculated. The relationship is corrected, if necessary, after vent samples are analyzed.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 Dose Rate Meter, preferably a high range ion chamber such as the CP-MU (Tech. Associates) or the Radector III (Victoreen) that are equipped with 50 foot cables for remote readout.

4.2 Data sheet for recording time and dose rate.

4.3 Personnel dosimeters including SRPD, Film and/or TLD badges.

5.0 PRECAUTIONS AND LIMIT VALUES:

5.1 Determine the dose rates in the Intermediate Building North (clean area) and select a low dose rate area to occupy while taking readings on the plant vent.

5.2 Use proper personnel dosimetry.

6.0 INTRUCTIONS:

6.1 If, in an emergency, the plant vent gas monitor (R-14) is off-scale high, proceed as follows:

6.1.1 Obtain a dose rate meter, preferably an ion chamber with a long cable for remote readout from a low dose rate area.

6.1.2 Obtain a SRPD, film and/or TLD for personnel dosimetry and a log sheet for recording time and dose rate.

6.1.3 Proceed to the Intermediate Building north (clean area) near the CV purge exhaust fans.

6.1.4 Survey the area to determine dose rates and background in the area. Penetrations in the CV including the purge exhaust line may have high radiation levels from streaming due to less shielding.

6.1.5 Mount the detector 11 feet south of the plant vent about 8½ feet high.

6.1.6 Record the dose rate due to the plant vent (subtract ambient background not due to the plant vent) and the time.

6.1.7 Determine the μCi/ml of noble gas in the plant vent by multiplying the dose rate from the plant vent in R/hour by 3.39.

6.1.8 Determine the curie/second release rate of noble gas by multiplying the dose rate from the plant vent in R/hour by 120.

6.2 To provide a more accurate conversion factor from dose rate to μCi/ml of noble gas in the plant vent, proceed as follows:

6.2.1 Once a shift, sample the plant vent and determine the noble gas isotopes and concentrations.

6.2.2 Divide the total concentration of noble gas present in μCi/ml by the dose rate reading in R/hour (at the time the sample was taken) to determine the new conversion factor).

6.2.3 Use the new conversion factor to correct previous concentrations determined by 5.1.7.

6.2.4 Multiply the total concentration (μCi/ml) of noble gas in the sample by the flow rate in cc/second up the plant vent to obtain the release rate in μCi/second. Multiply by 1E-6 to convert to Curies per second release rate. Divide by the dose rate from the plant vent in R/hour to obtain a new conversion factor from R/hour to curies per second.

6.2.5 Use the new conversion factor to correct previous release rates determined by 5.1.8.

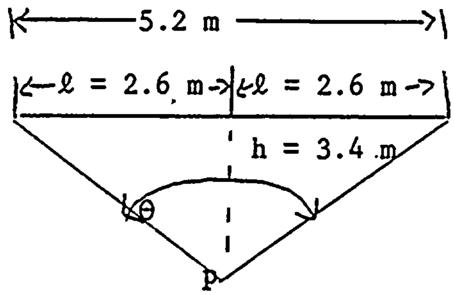
APPENDIX

Determination of the Plant Vent Release Rate from Dose Rate Measurements

1. Survey point is south of the plant vent pipe in the Intermediate Building North by the CV exhaust fans. The vent pipe is 17 feet high from floor to ceiling and the survey point is 11 feet south of the vent, 8½ feet up on a steel column. The vent will be considered a line source containing Xenon-133.

   Xe 133 τ = 0.01 R/hour per Ci @ 1 meter RHHB p131

   C ℓ = cures Xe133 per unit length of vent = 1 Ci/m



The Dose Rate at point p is given by the equation

$$Dp = \frac{(\tau)(Ci/m)(2)}{h} \ \text{Tan}^{-1} \frac{l}{h}$$

$$Dp = \frac{(0.01)(1)(2)}{3.4} \ \text{Tan}^{-1} \left(\frac{2.6}{3.4}\right)$$

$$Dp = 0.294 \cot 0.765$$

$$Dp = 0.294 \left(\frac{37.43\ \Pi}{180}\right)$$

$$Dp = 0.192 \text{ R/hour}$$

Therefore: When the vent contains 1 curie per meter length of Xe133, the dose rate 11 feet away and 8½ feet high will be 0.192 R/hour.

1 Ci/m represents a volume given by

$$\Pi r^2 h \qquad r = 27.5'' = 0.7 \text{ meters}$$

$$\Pi (0.7)^2 (1)$$

$$\text{Volume} = .49\ \Pi \text{ meter}^3$$

$$= 1.54 \text{ meter}^3$$

$$\frac{Ci}{1.54\ m^3} = 0.65\ Ci/m^3 = 0.65\ \mu Ci/cm^3$$

APPENDIX (Cont'd)

Therefore:

0.192 R/hr ~ 0.65 μCi/cm^3 in vent (of Xe133)

$$\frac{\mu Ci/cm^3}{R/hr} = 3.39$$

$$\frac{3.39\ \mu Ci/cm^3}{R/hr} \quad \text{Xe133, 11 feet away, } 8\tfrac{1}{2} \text{ feet up}$$

Stack flow ~ 75,000 cfm = 1250 cfs = 3.54 x 10^7 cc/sec.

$$\frac{(3.39\ \mu Ci/cm^3)(3.54 \times 10^7\ cc/sec)}{R/hr} = \frac{1.20 \times 10^8\ \mu Ci/sec}{R/hr}$$

$$\frac{1.20 \times 10^8\ \mu Ci/sec}{R/hour} = \frac{120\ Ci/sec}{R/hour} \quad \text{Xe133, 11 feet away, } 8\tfrac{1}{2} \text{ feet up.}$$

GINNA STATION
UNIT #1
COMPLETED

DATE :-

TIME :-

ROCHESTER GAS AND ELECTRIC CORPORATION

GINNA STATION

CONTROLLED COPY NUMBER 4

PROCEDURE NO. RD-3 REV. NO. 5

PLANT VENT IODINE AND PARTICULATE RELEASES

SAMPLING AND ANALYSIS

TECHNICAL REVIEW

PORC 1/22/79

Q/C REVIEW 1/30/79 DATE

APPROVED FOR USE

PLANT SUPERINTENDENT JAN 31 1979 DATE

QA X NON-QA ____ CATEGORY ____ THIS PROCEDURE CONTAINS 8 PAGES

LIFETIME ____ NONPERMANENT ____ REC. CENTRAL RECORDS DATE ____

REVIEWED BY ____ DATE ____ DISP. DATE ____

RD-3

PLANT VENT IODINE AND PARTICULATE RELEASES SAMPLING AND ANALYSIS

1.0 PURPOSE:

1.1 These instructions explain the procedure for sampling and analysis of radioactive iodine and particulate released to the environment from the Auxiliary Building and Intermediate Building ventilation system.

2.0 REFERENCES:

2.1 Technical Specifications, Section 3.9.2.2 - 3.9.2.5

2.2 HP-11.2, Iodine in Air - Charcoal Cartridge Method

3.0 PRINCIPLE:

3.1 A measured volume of air is continuously drawn from the Plant vent through an isokinetic nozzle and filtered to remove radioactive iodine and particulate. The filters are analyzed to determine the quantity of radioactive material present. The concentration of the radioactive material is determined by dividing by the volume sampled. The total amount of radioactivity discharge per unit time (release rate) is determined by multiplying the sample concentration by the vent flow rate and compared with the release rate limits.

4.0 PREREQUISITES AND NEEDED EQUIPMENT:

4.1 Particulate filters, 2 1/4" filter discs

4.2 Iodine cartridge, SAI #CP-100

4.3 Particulate and Iodine Analysis Sheet, see HP-11.2

4.4 Vent pre-filter analysis sheet, Attachment I.

5.0 PRECAUTIONS AND LIMIT VALUES:

5.1 The release limit for Iodine 131 from all sources is 2.9×10^{-8} Ci/Sec or 2.9 x E-2 μCi/sec. Based on 90,000 cfm plant vent design flow rate, the maximum allowable Iodine 131 concentration is 6.8 x E-10 μCi/cc.

5.2 For gaseous waste not sampled or analyzed prior to release, i.e. leaks, the release rate of 2.9 X E-2 μCi/sec cannot be exceeded after averaging over any 24 hour period. In other words, the total release of Iodine 131 cannot exceed 2.9 X E-2 μCi/sec X 8.64 X E4 sec/day = 2500 μCi/day in any 24 hour period.

5.2 Filters must be changed daily if the Iodine 131 exceeds 10% of the limit (6.8 X E-11 µCi/cc). Otherwise filters must be changed weekly.

5.4 During releases, one Auxiliary Building exhaust fan must be in operation and the radiogas, particulate and iodine activity monitors must be in operation.

6.0 INSTRUCTIONS:

6.1 Normal Sampling

6.1.1 Notify the Control Room that the filters on R10B are going to be changed.

6.1.2 Obtain the particulate and iodine analysis sheet for the filters currently in service and record the R10B cpm reading, vacuum, temperature and flow rate of the sample.

6.1.3 Shutdown the R10B pump and record time and date.

6.1.4 Remove and label filters. Mark direction of air flow the iodine cartridge.

6.1.5 Install a new IODINE cartridge, a new particulate filter, replace holding ring and install loaded filter holder into filter housing.

6.1.6 Check alignment of sample pump to Plant vent sample line. V1588, V1589 Open. V1590 Closed.

6.1.7 Start pump and fill out a new particulate and iodine analysis sheet.

6.2 Alternate Sampling

6.2.1 If R10B is inoperable, 10A can be used providing it is not being used to sample the containment vent during a purge.

6.2.2 To use R10A to sample the Plant vent, align the R10A pump as follows: V1588, V1590 Open, V1589, V1592, V1591 Closed.

6.2.3 If R10A cannot be used, insert a IODINE cartridge in the filter holder on R13-14.

6.3 Iodine Cartridge Analysis

6.3.1 Determine the volume sampled in cc's corrected to STP.

6.3.2 Determine the µCi of each isotope of iodine present using HP-11.2.

6.3.3 Determine the concentration of each isotope if iodine in µCi/cc.

NOTE: Iodine 131 and Iodine 133 are assumed to be collected on the charcoal cartridge at a uniform rate and corrections must be made for decay during the sampling period. Enter the correction factor from Tables 1 and 2 to the Calculation Sheet in HP-11.2.

6.3.4 Determine the total volume in cc's discharged from the Plant vent during the sampling period.

6.3.5 Determine the μCi of each isotpe discharged to the environment by multiplying the μCi/cc of each isotope by the total cc's discharged.

6.4 <u>Particulate Filter Analysis</u>

6.4.1 After at least three days decay, determine the gross beta and gross alpha activity.

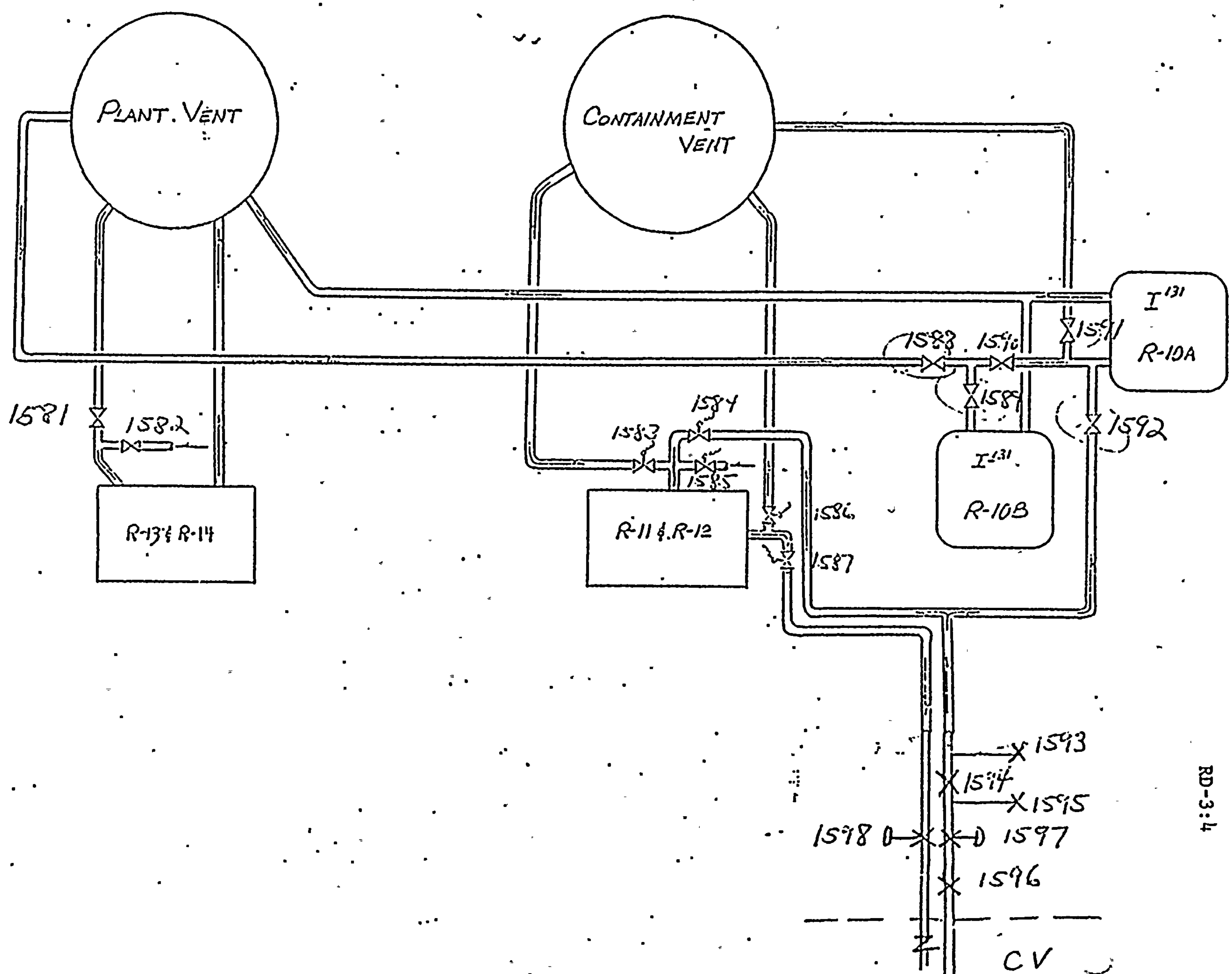
6.4.2 Divide by the sample volume to determine μCi/cc of gross beta and gross alpha.

6.4.3 Multiply μCi/cc by the total cc's discharged to the environment during the sampling period to determine the total μCi of gross beta and alpha release.

6.4.4 Monthly composite the filters and analyze for gamma-emitting isotopes.

6.4.5 Divide the μCi if each isotope by the total volume sampled through all the filters to determine μCi/cc of each isotope.

6.4.6 Multiply μCi/cc of each isotope by the total volume discharged to the environment during the month to determine μCi of each isotope released during the month.



RADIATION MONITORING SYSTEM — VENT MONITORS

RD-3:4

Refer to RD-3 & RD-1.1
for Instructions

__________ VENT PRE-FILTERS

For __________ to __________ 19____

Counted on GeLi for 20000 secs. with background subtracted.

	Vol. Sampled		Vol. Released
	x 10 cc		x 10 cc
	x 10 cc		x 10 cc
	x 10 cc		x 10 cc
	x 10 cc		x 10 cc
	x 10 cc		x 10 cc
TOTAL:	x 10 cc	TOTAL:	x 10 cc

Cs-134: 0.605 mev $\dfrac{(\quad - \quad)}{(2x10^4)(3.7x10^4)(0.98)(.00705)(\quad)cc}$ = µci/cc = µci released

CS-137: 0.662 mev $\dfrac{(\quad - \quad)}{(2x10^4)(3.7x10^4)(0.85)(.00622)(\quad)cc}$ = µci/cc = µci released

Nb-95: 0.766 mev $\dfrac{(\quad - \quad)}{(2x10^4)(3.7x10^4)(0.99)(.00525)(\quad)cc}$ = µci/cc = µci released

Co-58: 0.811 mev $\dfrac{(\quad - \quad)}{(2x10^4)(3.7x10^4)(0.99)(.00499)(\quad)cc}$ = µci/cc = µci released

CO-60: 1.173 mev $\dfrac{(\quad - \quad)}{(2x10^4)(3.7x10^4)(1.00)(0.00331)(\quad)cc}$ = µci/cc = µci released

TOTALS = _____ µci/cc _____ µci released

TOTAL µci RELEASED GAMMA (γ) = µci Analyst: ____________________

TOTAL µci RELEASED BETA (β) = µci Analyst: ____________________

Refer to RD-3
for Instructions

LLD - CALCULATIONS FOR 2 INCH DIAMETER FILTERS
COUNTED FOR 20,000 secs. @ 18mm. on GeLi DETECTOR

$$\text{LLD COUNTS} = 4.66\sqrt{\frac{\text{CPS BKG.}}{\text{TIME}}}$$

VOLUME of SAMPLE: __________ cc

DATE: __________ to __________ 19______

Date: 2/24/78

ISOTOPE	MEV.	ABUND.	EFF.	LLD uci	LLD uci/cc
Ce-144	0.1335	0.108	0.0380	3.31 E-5	
Ce-141	0.1454	0.480	0.0374	1.03 E-5	
Np-239	0.2776	0.140	0.0192	4.44 E-5	
Cr-51	0.3201	0.098	0.0159	7.35 E-5	
I-131	0.364	0.82	0.0133	8.47 E-6	
Ru-103	0.4971	0.90	0.00903	1.03 E-5	
Cs-134	0.6046	0.98	0.00705	1.07 E-5	
Cs-137	0.6616	0.86	0.00622	1.85 E-5	
Zr-95	0.7242	0.43	0.00559	2.14 E-5	
Nb-95	0.7658	0.99	0.00525	1.03 E-5	
Co-58	0.8106	0.99	0.00499	1.44 E-5	
Mn-54	0.8348	1.00	0.00477	1.11 E-5	
Te-132	0.9546	0.167	0.00409	6.96 E-5	
Fe-59	1.0993	0.565	0.00344	2.14 E-5	
Co-60	1.1732	1.00	0.00331	2.16 E-5	
Ba-La-140	1.5962	0.965	0.00245	1.10 E-5	

Using Point Source Eff. Curve Dated March 1, 1977.

CALCULATED BY: ____________________

CHECKED BY: ____________________

TABLE 1.

I-131 - $T_{\frac{1}{2}}$ = 8.05d

Days	Hours (t)	Decay Corrections: Sample To Count-Time ($e^{\lambda t}$)	Decay Corrections: During Sampling $\left(\frac{\lambda t}{1-e^{-\lambda t}}\right)$	Days	Hours (t)	($e^{\lambda t}$)	$\left(\frac{\lambda t}{1-e^{-\lambda t}}\right)$	Days	Hours (t)	($e^{\lambda t}$)	$\left(\frac{\lambda t}{1-e^{-\lambda t}}\right)$
	1	1.00	1.00		41	1.15	1.07		81	1.34	1.15
	2	1.01	1.00		42	1.16	1.08		82	1.34	1.16
	3	1.01	1.00		43	1.16	1.08		83	1.35	1.16
	4	1.01	1.00		44	1.17	1.08	3.5	84	1.35	1.16
	5	1.02	1.00		45	1.17	1.08		85	1.36	1.16
	6	1.02	1.01		46	1.18	1.08		86	1.36	1.17
	7	1.03	1.01		47	1.18	1.08		87	1.37	1.17
	8	1.03	1.01	2.0	48	1.19	1.08		88	1.37	1.17
	9	1.03	1.01		49	1.19	1.09		89	1.38	1.17
	10	1.04	1.02		50	1.19	1.09		90	1.38	1.17
	11	1.04	1.02		51	1.19	1.09		91	1.39	1.17
0.5	12	1.04	1.02		52	1.20	1.10		92	1.39	1.18
	13	1.05	1.03		53	1.21	1.10		93	1.39	1.18
	14	1.05	1.03		54	1.21	1.10		94	1.40	1.18
	15	1.05	1.03		55	1.22	1.10		95	1.40	1.18
	16	1.06	1.03		56	1.22	1.10	4.0	96	1.41	1.18
	17	1.06	1.03		57	1.23	1.11		97	1.42	1.18
	18	1.07	1.03		58	1.23	1.11		98	1.42	1.19
	19	1.07	1.03		59	1.23	1.11		99	1.43	1.19
	20	1.07	1.04	2.5	60	1.24	1.12		100	1.43	1.19
	21	1.08	1.04		61	1.25	1.12		105	1.46	1.20
	22	1.08	1.04		62	1.25	1.12		110	1.48	1.21
	23	1.08	1.04		63	1.25	1.12		115	1.51	1.22
1.0	24	1.09	1.04		64	1.26	1.12	5.0	120	1.54	1.23
	25	1.09	1.05		65	1.26	1.12		125	1.57	1.23
	26	1.10	1.05		66	1.27	1.12		130	1.59	1.24
	27	1.10	1.05		67	1.27	1.12		135	1.62	1.25
	28	1.10	1.05		68	1.27	1.13		140	1.65	1.26
	29	1.11	1.05		69	1.28	1.13	6.0	144	1.68	1.27
	30	1.11	1.05		70	1.28	1.13		150	1.71	1.28
	31	1.12	1.06		71	1.29	1.13		155	1.74	1.29
	32	1.12	1.06	3.0	72	1.29	1.13		160	1.78	1.31
	33	1.13	1.06		73	1.29	1.13		165	1.81	1.32
	34	1.13	1.06		74	1.30	1.14	7.0	168	1.83	1.32
	35	1.13	1.06		75	1.31	1.14		170	1.84	1.33
1.5	36	1.13	1.07		76	1.31	1.14		175	1.87	1.34
	37	1.14	1.07		77	1.32	1.14		180	1.90	1.35
	38	1.14	1.07		78	1.32	1.15		185	1.94	1.36
	39	1.15	1.07		79	1.32	1.15		190	1.98	1.37
	40	1.15	1.07		80	1.33	1.15		195	2.01	1.38
									200	2.05	1.39

TABLE 2.

I-133 – $T_{\frac{1}{2}}$ = 21 h

Days	Hours (t)	Decay Corrections: Sample To Count-Time ($e^{\lambda t}$)	Decay Corrections: During Sampling $\left(\frac{\lambda t}{1-e^{-\lambda t}}\right)$	Days	Hours (t)	($e^{\lambda t}$)	$\left(\frac{\lambda t}{1-e^{-\lambda t}}\right)$	Days	Hours (t)	($e^{\lambda t}$)	$\left(\frac{\lambda t}{1-e^{-\lambda t}}\right)$
	1	1.03	1.01		41	3.86	1.83		81	14.5	2.87
	2	1.07	1.03		42	4.00	1.85		82	15.0	2.90
	3	1.10	1.05		43	4.13	1.87		83	15.5	2.93
	4	1.14	1.07		44	4.27	1.89	3.5	84	16.0	2.96
	5	1.18	1.08		45	4.41	1.92		85	16.5	2.99
	6	1.20	1.10		46	4.54	1.94		86	17.1	3.02
	7	1.25	1.12		47	4.71	1.97		87	17.6	3.05
	8	1.30	1.14	2.0	48	4.87	1.99		88	18.2	3.08
	9	1.35	1.16		49	5.04	2.02		89	18.9	3.11
	10	1.39	1.18		50	5.21	2.05		90	19.5	3.13
	11	1.43	1.19		51	5.38	2.07		91	20.1	3.16
0.5	12	1.48	1.21		52	5.56	2.09		92	20.8	3.20
	13	1.53	1.23		53	5.75	2.12		93	21.5	3.23
	14	1.59	1.24		54	5.93	2.15		94	22.2	3.26
	15	1.64	1.26		55	6.14	2.18		95	23.0	3.30
	16	1.69	1.28		56	6.34	2.20	4.0	96	23.8	3.33
	17	1.75	1.29		57	6.55	2.23		97	24.6	3.36
	18	1.81	1.32		58	6.78	2.25		98	25.4	3.38
	19	1.87	1.33		59	6.99	2.27		99	26.2	3.41
	20	1.93	1.36	2.5	60	7.24	2.30		100	27.1	3.44
	21	2.00	1.38		61	7.48	2.32		105	31.9	3.50
	22	2.07	1.41		62	7.73	2.35		110	37.7	3.72
	23	2.13	1.43		63	8.00	2.37		115	44.4	3.87
1.0	24	2.20	1.44		64	8.24	2.39	5.0	120	52.5	4.02
	25	2.28	1.47		65	8.53	2.42		125	61.5	4.20
	26	2.36	1.49		66	8.83	2.45		130	73.	4.37
	27	2.44	1.52		67	9.16	2.48		135	86.	4.54
	28	2.51	1.54		68	9.43	2.50		140	101.	4.71
	29	2.60	1.57		69	9.74	2.53	6.0	144	115.	4.85
	30	2.69	1.59		70	10.1	2.56		150	141.	5.03
	31	2.78	1.61		71	10.4	2.58		155	166.	5.23
	32	2.87	1.63	3.0	72	10.8	2.61		160	196.	5.38
	33	2.97	1.66		73	11.1	2.64		165	230.	5.53
	34	3.07	1.68		74	11.5	2.67	7.0	168	255.	5.62
	35	3.17	1.70		75	11.9	2.69		170	270.	5.68
1.5	36	3.27	1.72		76	12.3	2.72		175	320.	5.83
	37	3.39	1.74		77	12.7	2.75		180	380.	5.98
	38	3.50	1.76		78	13.1	2.78		185	445.	6.12
	39	3.61	1.78		79	13.5	2.81		190	525.	6.28
	40	3.74	1.80		80	14.0	2.84		195	620.	6.45
									200	730.	6.61