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 FACIL: STN-50-528 Palo Verde Nuclear Station, Unit 1, Arizona Public 05000528
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 STN-50-530 Palo Verde Nuclear Station, Unit 3, Arizona Public 05000530
 AUTH. NAME AUTHOR AFFILIATION
 VAN BRUNT, E.E. Arizona Public Service Co.
 RECIP. NAME RECIPIENT AFFILIATION
 KNIGHTON, G. Licensing Branch 3

SUBJECT: Forwards response to 830308 request for addl info re
 mechanical equipment qualification program & 831011 ltr,
 Section 4.2 re safety-related mechanical equipment.
 Description of GDC-4 & SRP Section 3.11 also included.

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NOTES: Standardized plant. 05000528
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 Standardized plant. 05000530

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	IE FILE	09	1	1	NRR CALVO, J		1 1
	NRR/DE/eqb	07	2	2	NRR/DL DIR	14	1 1
	NRR/DL/ORAB	06	1	1	NRR/DSI/AEB		1 1
	REG FILE	04	1	1	RGNS		1 1
EXTERNAL:	ACRS	15	8	8	LPDR	03	1 1
	NRC PDR	02	1	1	NSIC	05	1 1
	NTIS	31	1	1			

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Arizona Public Service Company

P.O. BOX 21666 • PHOENIX, ARIZONA 85036

November 9, 1983
ANPP-28215 - WFQ/RJP

Director of Nuclear Reactor Regulation
Attention: Mr. George Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2 and 3
Docket Nos. STN-50-528/529/530
File: 83-056-026; G.1.01.10

- Reference: 1. Letter from G. W. Knighton, NRC, to E. E. Van Brunt, Jr. APS, dated March 8, 1983. Subject: Environmental Qualification of Safety-Related Mechanical Equipment Located in Harsh Environment - Palo Verde.
2. Letter from G. W. Knighton, NRC, to E. E. Van Brunt, Jr., APS, dated October 11, 1983. Subject: Staff Review of Environmental Qualification of Equipment for Palo Verde.
3. Letter from E. E. Van Brunt, Jr., APS, to G. W. Knighton, NRC, dated November 8, 1983.

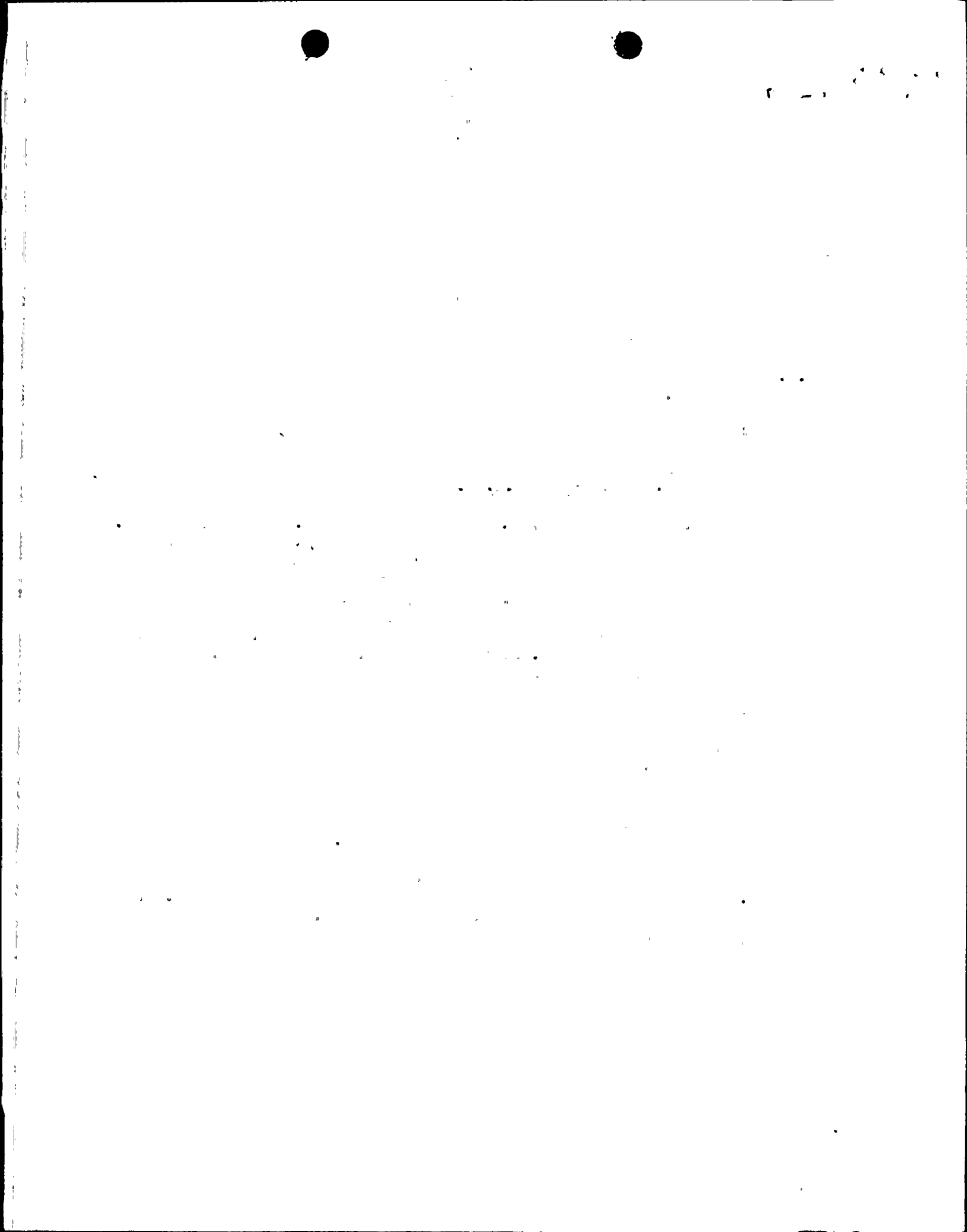
Dear Mr. Knighton:

The attached information is provided in response to References (1) and (2) (Section 4.2). Reference (1) requested additional information on the Mechanical Equipment Qualification Program. Reference (2), section 4.2 entitled Safety-Related Mechanical Equipment, is responded to, with the exception of items 2 and 3 on page B-16. In addition, a description of how we meet GDC-4 and SRP section 3.11 is included.

APS will expeditiously continue with the Mechanical Equipment Qualification Program. This program is expected to be complete in June of 1984. Any equipment not qualified prior to full power operation will be justified for interim operation, per Reference (3).

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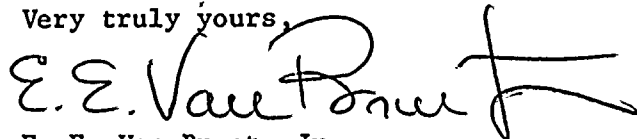
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Mr. G. W. Knighton
Page 2

If you have any questions, please contact me.

Very truly yours,

A handwritten signature in dark ink, appearing to read "E. E. Van Brunt, Jr.", with a stylized flourish at the end.

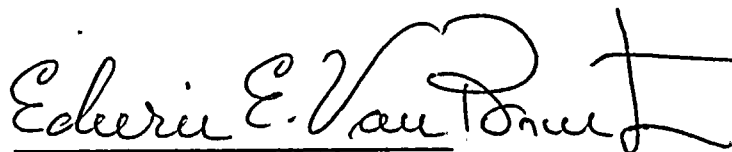
E. E. Van Brunt, Jr.
APS Vice President
Nuclear Projects Management
ANPP Project Director

EEVB/RJP/sp
Attachment

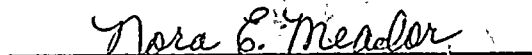
cc: E. A. Licitra (w/a)
A. C. Gehr "

STATE OF ARIZONA)
) ss.
COUNTY OF MARICOPA)

I, Edwin E. Van Brunt, Jr., represent that I am Vice President, Nuclear Projects of Arizona Public Service Company, that the foregoing document has been signed by me on behalf of Arizona Public Service Company with full authority to do so, that I have read such document and know its contents, and that to the best of my knowledge and belief, the statements made therein are true.


Edwin E. Van Brunt, Jr.

Sworn to before me this 9th day of November, 1983.


Notary Public

My Commission Expires:

My Commission Expires April 6, 1987



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List of Attachments

Page No.	Title
1	Identification of Non-Metallic Subcomponents
2	Environmental Conditions for Qualifications
3	Non-Metallic Material Capabilities
4	Evaluation of Environmental Effects
5	PVNGS Mechanical Equipment Qualification Program Description
6	How PVNGS Complies with GDC 4
10	Table 1 BOP Safety Related Mechanical Equipment
19	Table 2 NSSS Safety Related Mechanical Equipment

IDENTIFICATION OF NON-METALLIC SUBCOMPONENTS

The review of the non-metallic subcomponents of mechanical equipment located in a harsh environment has identified twenty-three (23) separate materials. Of these identified items, approximately ten (10) have a known qualified life of less than 40 years.

The twenty-three identified materials are used by themselves or in combination with other materials to form heterogeneous components under various trade names. Since these are not compounds, each material can be analyzed separately to determine its own environmental effects.

The most common non-metallic materials used in the mechanical equipment are asbestos, graphite, ethylene propylene rubber and silicon. Asbestos is commonly found in high temperature applications as a gasket material. Asbestos is also used in flexitallic gaskets, which are stainless steel rings with an asbestos filler. In addition, it is used in garlock bushings and washers as a binder, heterogeneously blended with styrene butadiene rubber or teflon depending upon the type.

Graphite is used as the primary ingredient in grafoil, John Crane 241 and John Crane 1625 GE packing. These packings are used in valves, turbines and high temperature applications where service conditions are severe.

Neoprene and silicon rubber are found extensively used in HVAC equipment as gasket and sealing material. Silicon rubber is also used for gaskets and O-rings in solenoid valves whereas ethylene propylene rubber is used as O-rings and packing in butterfly valves.

Testing and analysis is incomplete, our progress to date suggests the following assignments of status:

<u>40 Year Qualified Material</u>	<u>Potential Life Limited Material</u>	<u>Known Life Limited Material</u>
Phenolic	Polyester	Teflon
Asbestos	Polyurethane	Styrene Butadiene Rubber
Urethane	Polyamide-Imide	Buna-N
Graphite	Polyethylene	Ethylene Propylene
Fiberglass	Fluorocarbon	Cellulose Fiber
Cottonite		Viton
PVC		Silicon
Ceramics		Polymide
		Nylon
		Neoprene

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ENVIRONMENTAL CONDITIONS FOR QUALIFICATION

The harsh environmental area designators for the building listed on table I are as follows:

<u>Building</u>	<u>Elevation</u>	<u>Environmental Designator</u>
Containment	All	I
MSSS	All	II
Aux Building	All	III
Fuel Building	All	VI

The following are the applicable pages from Table 3E-1 of the FSAR which list the environmental qualification requirements for these environmental designators.

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 1 of 8)
CONTAINMENT BUILDING - ENVIRONMENTAL DESIGNATOR I (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)		
		LOCA	MSLB	TIME DURATION
Temperature (F)	50 - 120	350 350 302 302-270 270-200	370 350 302 302-270 270-200	4 Min 8 Min 8 Hr 42 Hr 2 Wk
Pressure (psig)	ATM. (a)	60 55 25 10		12 Min 8 Hr 42 Hr 2 Wk
Relative Humidity (%)	20 - 90%	Steam/Air Mixture		
Radiation (Rads) (40 Year Integrated Dose)	1×10^7	3.3×10^7 Gamma 2×10^8 Beta (non-sprayed enclosures) 1×10^8 Beta (all other areas)		
Chemicals	None	<ul style="list-style-type: none"> 4400 ppm Boron 50 ppm Hydrazine pH adjusted to 7.0-8.5 after 4 hours using Trisodium phosphate 		

a. Structural Integrity Test Pressure = 69 psig.

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588
PVNGS 1,263

REVIEW TECHNIQUE

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 2 of 8)
CONTAINMENT BUILDING - ENVIRONMENTAL DESIGNATOR I (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	Below Plant El. 91'
Dust	$1.52 \mu\text{G}/\text{M}^3$	$650 \mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588
PVNGS 1,263

REVIEW TECHNIQUE

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 3 of 8)
MAIN STEAM SUPPORT STRUCTURE - ENVIRONMENTAL DESIGNATOR II (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)	
		LOCA/MSLB	Time Duration
Temperature (F)	28 - 120	300 (above El. 100')	15 minutes
		28-120 (below El. 100')	not appli- cable(b)
Pressure (psig)	ATM	21 (above El. 100')	15 minutes
		ATM (below El. 100')	not appli- cable(b)
Relative Humidity (%)	20 - 90%	Steam/Air Mixture (above El. 100') 20-90% (below El. 100')	
Radiation (Rads) (40 Year Integrated Dose)	<10 ³	10 ⁶ (above El. 100') 10 ⁵ (below El. 100')	
Chemicals	None	None	

b. The subcompartments below elevation 100' are unaffected by the MSSS design basis pipe break.

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREC-0588
PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 4 of 8)
MAIN STEAM SUPPORT STRUCTURE - ENVIRONMENTAL DESIGNATOR II (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 µG/M ³ (Below El. 100') 61.3 µG/M ³ (Above El. 100')	650 µG/M ³ (Below El. 100') 131 mG/M ³ (Above El. 100')
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifications for requirements	Refer to Equipment Specifications for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREC-0588
PVNGS 1,2&3

REVIEW TECHNIQUE

June 1983

4.1-137

Amendment 1

Amendment 1

4.1-138

June 1983

June 1983

4.1-139

Amendment 1

Amendment 1

4.1-140

June 1983

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 5 of 8)
AUXILIARY BUILDING - ENVIRONMENTAL DESIGNATOR III (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)	
		LOCA/MSLB	Aux Steam Break
Temperature (F)	50 - 104	50 - 104	50 - 318F ^(c)
Pressure (psig)	ATM	ATM	1.5 ^(d)
Relative Humidity (%)	20 - 90%	20 - 90%	20 - 100%
Radiation (Rads) (40 Year Integrated Dose)	3.5 x 10 ⁴ (accessible areas) 1.25 x 10 ⁷ (Volume Control Tank) 2.7 x 10 ⁹ (Purification Ion Exch.)	1 x 10 ⁶ (accessible areas) ^(e) 1.25 x 10 ⁷ (Volume Control Tank) 2.7 x 10 ⁹ (Purification Ion Exch.)	
Chemicals	None	None	

- c. Applicable to Class 1E electrical cable only (Class 1E cable satisfies qualification envelope for containment)
- d. Pressure is a transient effect (i.e., several seconds duration)
- e. For an intact primary degraded core event, rooms containing LPSI recirculation fluids will have integrated radiation levels of 6.4×10^6 Rads. Equipment subject to this dose is identified in table 3.3-7.

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588
PVNGS 1,2&3

REVIEW TECHNIQUE

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 6 of 8)
AUXILIARY BUILDING - ENVIRONMENTAL DESIGNATOR III (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifi- cations for requirements	Refer to Equipment Specifi- cations for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588
PVNGS 1,2&3

REVIEW TECHNIQUE

June 1983

4.1-141

Amendment 1

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 7 of 8)
FUEL BUILDING - ENVIRONMENTAL DESIGNATOR VI (1 of 2)

Condition Parameter	Normal/Abnormal (N)	Design Basis Accident (A) (Includes 40 Year Integrated)
		LOCA/MSLB
Temperature (F)	50 - 104	50 - 104
Pressure (psig)	ATM	ATM
Relative Humidity (%)	20 - 90%	20 - 90%
Radiation (Rads) (40 Year Integrated Dose)	<10 ³	10 ⁵
Chemicals	None	None

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

Amendment 1

4.1-142

June 1983

Table 4.1-3
ENVIRONMENTAL QUALIFICATION PARAMETERS (Sheet 8 of 8)
FUEL BUILDING - ENVIRONMENTAL DESIGNATOR VI (2 of 2)

Condition Parameter	Normal/Abnormal	Design Basis Accident
		LOCA/MSLB
Submergence	None	None
Dust	1.52 $\mu\text{G}/\text{M}^3$	650 $\mu\text{G}/\text{M}^3$
Seismic	2 OBE's (Refer to Seismic Response Spectra)	1 SSE (Refer to Seismic Response Spectra)
Dynamic	Refer to Equipment Specifi- cations for requirements	Refer to Equipment Specifi- cations for requirements
Aging	Equipment must be qualified for 40 year life for environmental parameters	Equipment must be qualified for 40 year life plus DBA for environmental parameters

ENVIRONMENTAL QUALIFICATION REPORT
PER REQUIREMENTS OF NUREG-0588

REVIEW TECHNIQUE

NON-METALLIC MATERIAL CAPABILITIES

Non-metallic materials which are used in mechanical equipment located in a harsh environment, are researched to determine their capabilities to withstand extremes in temperature and radiation. This research may consist of testing, analysis, literature searches or a combination of approaches.

The following table is a summary of capabilities of the generic non-metallic materials found in our safety related mechanical equipment .

<u>Material</u>	<u>Activation Energy (eV)</u>	<u>Radiation Threshold (rads)</u>
Phenolic	1.02	2.7×10^{15}
Asbestos	NAS	$10^{10} - 3.96 \times 10^{15}$
Teflon	1.69	$1.5 \times 10^4 - 1.7 \times 10^4$
Styrene Butadiene	0.96 - 1.15	2×10^6
Urethane	0.89	3×10^8
Graphite	NAS	9.1×10^8
Buna-N	0.68 - 0.92	2×10^6
Ethylene Propylene	0.41 - 1.42	$10^6 - 10^7$
Cellulose Fiber	0.90	10^5
Viton	1.26	5×10^6
Polyester	TBD	TBD
Silicon	0.77 - 0.86	10^6
Polyimide	1.57	10^7
Nylon	0.93	10^7
Neoprene	1.05	$8 \times 10^5 - 2 \times 10^6$
Polyurethane	TBD	TBD
Fiberglass	NAS	NRS
Polyamide-Imide	TBD	1×10^9
Cottonite	1.35	1×10^5
PVC	1.05 - 1.15	$5 \times 10^5 - 1.6 \times 10^7$
Polyethylene	1.11	8.7×10^7
Ceramic Cement	NAS	NRS
Fluorocarbon	TBD	1×10^8

NAS = Not Aged Sensitive

TBD = To Be Determined

NRS = Not Radiation Sensitive

EVALUATION OF ENVIRONMENTAL EFFECTS

The evaluation of the environmental effects upon non-metallic subcomponents in mechanical equipment is a three step process. (1) The first step in the evaluation is to develop a material list for the non-metallic components. This information may be obtained from such sources as the bill of material, instruction manuals, maintenance manuals, and direct correspondence with the supplier. (2) Research into existing literature and test data is then performed to obtain thermal aging characteristics, age mechanisms, failure criteria, and susceptibility to radiation. (3) An evaluation of this data is performed against the known environmental service condition for the equipment located in a harsh environment which is used as a basis upon which to establish a qualified life. An Arrhenius Plot based upon a known acceptance criteria is developed to assess the expected amount of degradation.

With an established Arrhenius plot for the material, this data can be applied against the environmental service temperature in order to arrive at a qualified life, during which the material in question will perform its intended safety related function with a predicted amount of anticipated degradation.

Irradiation analysis is performed by researching known test data and results to determine radiation thresholds of the material in question. This data is then compared with the known 40 year integrated plus accident dose and, if this is less than the threshold level, then the material is qualified for its intended service location.

PVNGS Mechanical Equipment Qualification Program Description

The Mechanical Equipment Qualification Program is not expected to be 100% complete at the time of fuel load. This is attributable to the fact that mechanical environmental qualification is not considered or handled separately from the existing qualification programs currently in progress.

As previously mentioned, the work of addressing potential age degradable components started in 1980 in order to obtain a head start on what the project felt were potential future requirements. It was also advantageous to commence this work while the purchase orders were still open with most suppliers to obtain their participation. It was our experience that most suppliers knew that there were no regulatory requirements to environmentally qualify mechanical equipment. Since suppliers were not anticipating future orders from nuclear power plants, many stated that they would not accept future bids.

A limited number of suppliers, as part of their existing test programs, did preage the mechanical equipment as part of the electrical equipment prior to LOCA/MSLB and/or seismic testing. Attempts to have suppliers determine the subsequent qualified life based upon prior testing was successful in these cases because of the minimal effort required on their part.

Similarly, in an isolated number of cases where qualification was not near completion, the supplier preaged the mechanical equipment prior to Design Basis Accident testing and a qualified life was subsequently or tentatively determined.

Finally, where suppliers; 1) refused to perform any additional qualification work which was not part of the original specification, or 2) where purchase orders had been closed, or 3) where it was felt that the effort could be handled more expeditiously, an independent testing laboratory was contracted to perform an aging analysis based upon known aging mechanisms obtained from prior test data. Approximately nine BOP specifications are in this category.

The NSSS environmental qualification program for mechanical equipment was defined based on what had been learned in the BOP program. It was anticipated that materials research done for the BOP equipment would be largely applicable to the NSSS equipment. The NSSS program is being performed in two phases. The first phase has established the list of NSSS "active" components and identified the principal non-metallic materials used in these components. This phase is complete with components listed as part of Table 2. The second phase involves (1) expansion of the list to include non-active components in safety systems, (2) performing a failure modes analysis on each component, and (3) performing an in-depth evaluation of non-metallic materials used in these components. It is anticipated that this program will be completed in the second quarter of 1984.

In the cases where the vendor is going to do the qualification work, more time is required for completion as the vendors are handling the mechanical equipment in the same manner as the electrical equipment. In these cases, the mechanical portion will be completed at the same time as the electrical portion. Those time frames are determined by the vendors' test schedule and not by APS.

Based upon the previous discussion, it is not possible to guarantee 100 percent completion of the mechanical equipment qualification effort by fuel load. This is also based upon the fact that a report is not given a status 1 until all technical and documentation comments are resolved. Until then, its status will remain as "in progress".

HOW PVNGS COMPLIES WITH GDC4

From our review of GDC4, we have found that it makes no distinction between electrical and mechanical equipment. It only addresses two aspects of design:

1. Equipment/system design "to accommodate the effects of and to be compatible with the environmental conditions," and;
2. Plant design to assure that equipment/systems are "appropriately protected against dynamic effects."

From our review of the Standard Review Plan, Section 3.11, Part II, we have found that it addresses environmental qualification as well as design, and points out that, "specific criteria, task action plans, regulatory guide, and industry standards...", are to be used in determining environmental design acceptability to three general requirements:

1. Designed capability to perform its function;
2. Environmental capability demonstration by appropriate testing and analysis, and;
3. QA program implementation to 10 CFR 50, Appendix B.

It further requires that, "complete and auditable records must be available and maintained...which described the environmental qualification method used...in sufficient detail to document the degree of compliance...", and requires that these records be updated and maintained current.

This is the complete regulatory and review picture regarding GDC 4 as we see it.

IN THE SUPREME COURT OF THE UNITED STATES

IN THE SUPREME COURT OF THE UNITED STATES

IN THE SUPREME COURT OF THE UNITED STATES

We are in compliance with of GDC 4, as all our safety related equipment, systems, and plant areas are designed to accommodate and be compatible with environmental conditions, both normal and design basis, and to be protected against dynamic effects. This design is explained in detail in the FSAR; is implemented through our Design Criteria Manual, equipment purchase specifications, System Description Manual, installation specifications, drawings, and other design documents, and is assured by our Quality Assurance Program, which meets the requirements of ANSI N45.2 and daughter standards, as well as 10 CFR Part 50, Appendix B.

The requirements of 10 CFR 50, Appendix B, covered in its introduction, are for the SAR to have a description of the Quality Assurance Program to be applied during the construction and operations phases of PVNGS. This requirement is met in PSAR Section 17.1A.3 and FSAR Section 17.2.3, respectively. The PSAR, which applies to "design, fabrication, construction, and testing of the structures, systems, and components," is the most pertinent documentation regarding the QA program as it relates to equipment qualification.

Section 17.1A.3.2-A., of the PSAR, states;

"The implementation of design process control methods has been delegated to Bechtel and CE subject to review by APS NS and audit by QA."

This is fully in accordance with 10 CFR 50, Appendix B, Section I. (NS refers to Nuclear Services, which is now the Nuclear Engineering Department of APS.)

In addition, Section 17.1A.3.2-D, of the PSAR, states;

"When a test program is specified to verify adequacy of the design, qualification testing of a prototype unit subjected to the most adverse design conditions shall be used."

This is in full compliance with 10 CFR 50, Appendix B, section III.

The PVNGS PSAR was reviewed and accepted in the Construction Permit (CP) stage of the project, by the NRC. At this time it was ascertained, that the APS Corporate QA program fully met the requirements of 10 CFR 50, Appendix B.

Since that time QA has audited Bechtel and CE on a periodic basis to assure that their QA programs, which control their design process implementation, are in accordance with the above requirements as well as ANSI N.45.2. Also, APS QA has been periodically audited by the NRC, Region V, and has consistently been found also to be in compliance.

We are in compliance with the Standard Review Plan section 3.11 through the afore described design control process and QA program, and the Seismic and Environmental Qualification Programs.

The Seismic Qualification Program, based on IEEE Standard 344 and Reg. Guide 1.100, establishes and documents the capability of the safety related equipment, systems, structures, and plant areas to function before, during, and after the Design Basis Earthquake. The audit on this activity has been successfully completed and we are in the process of finalizing the documentation.

An additional benefit of this program is the functional operability verification, which was also used, along with design and operating information, to satisfy the Pump and Valve Operability Review Team (PVORT) auditors. This resulted in a successful audit as well. The PVORT equipment encompasses almost all of the mechanical equipment subject to environmental qualification.

With operability verified, all that is needed to complete mechanical environmental qualification is to evaluate the effects of failure of the non-metallic components on the operability of the equipment and, if it is not negligible, to analyse the effects of aging on these components. This program is in progress, having been initiated shortly following the issuance of draft IEEE-627. It was decided at that time that this was an important subject and had potential future licensing impact.

However, as opposed to the environmental qualification of electrical equipment, which is well defined by IEEE standards (323, 334, 383, etc.), a regulatory guide (R.G. 1.89), and nuclear regulations (79-01B, CLI-80-21, NUREG-0588, and 10CFR50.49), there is virtually no specific guidance or regulation available to address mechanical equipment environmental qualification.

Due to the lack of specific information, it took us some time to develop the approach discussed herein. Because of the lack of regulatory guidance and/or requirements we were faced with great uncertainty as to whether our program would be consistent with possible forthcoming requirements. In order to be able to devote our resources to issues which had regulatory guidance and requirements (i.e. PVORT, SORT, and electrical E.Q.), it was decided to proceed in a slow, very deliberate manner. This enabled us to create a program with maximum flexibility to; 1) meet future regulatory contingencies, 2) give detailed guidance to our vendors, consultants, and test labs, and 3) obtain the best possible results. It is this careful, deliberate program which has defined the "appropriate testing and analysis" of SRP 3.11, to be used in this effort. The method and the schedule have been determined by us to be the appropriate way to proceed in light of the aforementioned lack of industry consensus and regulatory guidance.

In addition, since SRP 3.11 does not require program completion prior to O.L., but merely method description "in sufficient detail to document the degree of compliance...", it is our position that our program fully meets the requirements of the SRP.

Therefore, it is our position that, in addition to the specific requirements of GDC 4, we also meet the additional guidance given by SRP Section 3.11 in the areas of design, qualification, Quality Assurance, and records keeping. Our records are continually updated and maintained current, as they are a part of our overall qualification effort and meet the requirements of our QA program. The NRC may inspect these records periodically during the PVNGS environmental qualification program process to provide assurance that this activity is being performed as outlined herein.

TABLE 1
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
BOP EQUIPMENT

Page 1 of 9

SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
J601A	Globe Valve (Control Components Inc.)	EX69-X3-X6-P6-X6P6-13MH31	J-AFB-HV-30 J-AFB-HV-31 J-AFA-HV-32 J-AFC-HV-33	MSSS MSSS MSSS MSSS	Below 100' Below 100' Below 100' Below 100'	J601A-117	In Progress	30 days
	Atmospheric Dump Globe Valve (Control Components Inc.)	B3G9-10-12P8-12P8-31NA51	J-SGA-HV-179 J-SGB-HV-178 J-SGA-HV-184 J-SGB-HV-185	MSSS MSSS MSSS MSSS	Above 100' Above 100' Above 100' Above 100'	NES-57555	In Progress	30 days
J601B	Control Valves (Fisher)	ITTY5-1008	J-ECA-HCV-41 J-ECA-HCV-53 J-ECA-HCV-59 J-ECA-HCV-65 J-ECA-HCV-71 J-ECA-HCV-115 J-ECB-HCV-42 J-ECB-HCV-48 J-ECB-HCV-54 J-ECB-HCV-60 J-ECB-HCV-66 J-ECB-HCV-72	Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg MSSS Aux Bldg MSSS Aux Bldg Aux Bldg Aux Bldg Aux Bldg	120' 70' 51'-6" 51'-6" 51'-6" Below 100' 100' Below 100' 70' 51'-6" 51'-6" 51'-6"	LATER	In Progress	30 days
J603	Solenoid Operated Valves (Target Rock)	76HH-001 76HH-002 76HH-003 76HH-005	J-EWA-LV-91 J-EWB-LV-92 J-HCA-UV-45 J-HCA-UV-46 J-HCB-UV-44 J-HCB-UV-47 J-HCA-UV-74 J-HCB-UV-75 J-HCC-UV-76 J-HCD-UV-77 J-HPA-HV-7A J-HPA-HV-7B J-HPA-HV-8A J-HPA-HV-8B	Aux Bldg Aux Bldg Aux Bldg Aux Bldg Containment Containment Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg	120' 120' 70' 70' 90' 90' 88' 88' 88' 88' 88' 88' 88' 88'	2302G	Completed	30 days

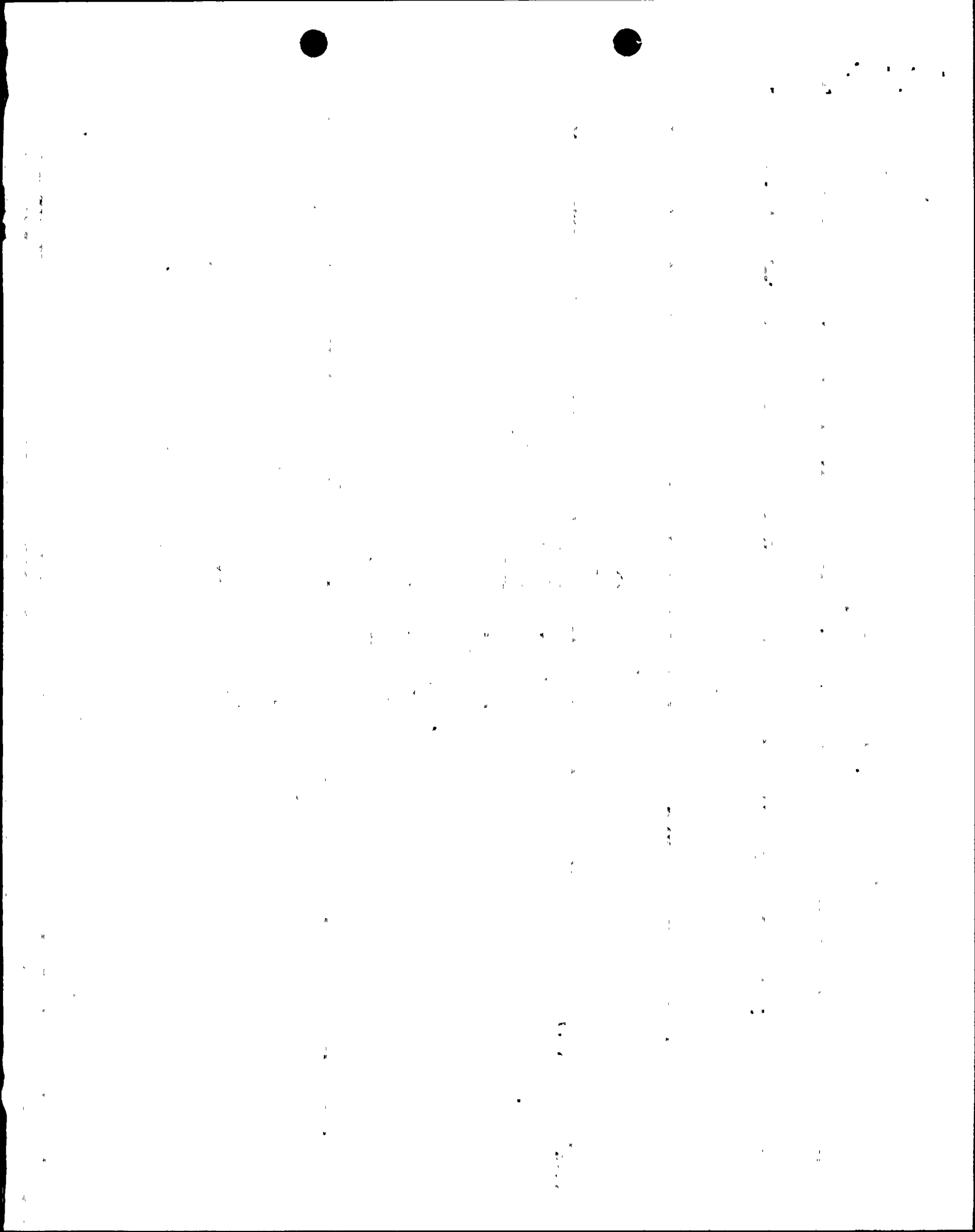


TABLE 1
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
BOP EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
J603	Solenoid Operated Valves (Target Rock)	76HH-007	J-SGA-PV-313A	MSSS	Above 100'	3481	Completed	30 days
			J-SGA-PV-313B	MSSS	Above 100'			
			J-SGB-PV-306A	MSSS	Above 100'			
			J-SGB-PV-306B	MSSS	Above 100'			
		76HH-008	J-RCA-HV-101	Containment	140'			
			J-RCA-HV-103	Containment	160'			
			J-RCA-HV-106	Containment	160'			
			J-RCB-HV-102	Containment	140'			
			J-RCB-HV-104	Containment	160'			
			J-RCB-HV-105	Containment	160'			
			J-SGA-UV-1133	MSSS	Above 100'			
			J-SGA-UV-1134	MSSS	Above 100'			
			J-SGA-UV-1135A	MSSS	Above 100'			
			J-SGA-UV-1135B	MSSS	Above 100'			
			J-SGA-UV-1136A	MSSS	Above 100'			
			J-SGA-UV-1136B	MSSS	Above 100'			
		76HH-009	J-RDB-UV-407	Aux Bldg	72'			
		76HH-010	J-SIA-UV-708	Aux Bldg	74'			
			J-SIA-UV-709	Aux Bldg	141'			
			J-SIB-UV-710	Aux Bldg	72'			
			J-CHB-UV-924	Aux Bldg	88'			
		76HH-011	J-CHA-UV-715	Aux Bldg	91'			
			J-HPA-UV-23	Aux Bldg	88'			
			J-HPB-UV-24	Aux Bldg	88'			
		76HH-020	J-GAA-UV-1	Aux Bldg	88'			
		76HH-021	J-GAA-UV-2	Aux Bldg	88'			
		76HH-023	J-GRB-UV-2	Aux Bldg	88'			
			J-IAA-UV-2	Aux Bldg	88'			
J605	Butterfly Valves (Pratt)	NXL/1100-MDT-4	J-EWA-HCV-5	Aux Bldg	70'	J605-167	In Progress	30 days
			J-EWA-HCV-41	Aux Bldg	70'			
			J-EWA-HCV-53	Aux Bldg	70'			
			J-EWA-HCV-135	Aux Bldg	70'			
			J-EWB-HCV-6	Aux Bldg	70'			
			J-EWB-HCV-42	Aux Bldg	70'			
			J-EWB-HCV-54	Aux Bldg	70'			
			J-EWB-HCV-136	Aux Bldg	70'			

TABLE 1
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SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
J605	Butterfly Valves (Pratt)	NXL/1100-MDT-3	J-EWB-HCV-66	Aux Bldg	70'	J605-167	In Progress	30 days
			J-EWB-HCV-146	Aux Bldg	70'			
			J-EWA-HCV-67	Aux Bldg	70'			
		NXL W/MDT-2HW	J-EWA-HCV-133	Aux Bldg	70'			
			J-EWB-HCV-68	Aux Bldg	70'			
			J-EWB-HCV-134	Aux Bldg	70'			
			J-NCA-HCV-244	Aux Bldg	100'			
			J-NCA-HCV-258	Aux Bldg	100'			
			J-NCB-HCV-245	Aux Bldg	100'			
		NXL/1100	J-NCB-HCV-259	Aux Bldg	100'			
			J-EWA-UV-65	Aux Bldg	70'			
			J-EWA-UV-145	Aux Bldg	70'			
		MDT-6HW	J-EWA-HCV-71	Aux Bldg	100'			
			J-EWB-HCV-72	Aux Bldg	100'			
			J-NCA-HCV-262	Fuel Bldg	100'			
		NSL-2FII/1400-MDT-3	J-NCA-HCV-264	Fuel Bldg	100'			
			J-NCB-HCV-263	Fuel Bldg	100'			
			J-NCB-HCV-265	Fuel Bldg	100'			
		NXL/1100	J-NCA-UV-402	Aux Bldg	88'			
			J-NCB-UV-401	Aux Bldg	88'			
			J-NCB-UV-403	Containment	82'			
		NSL-2FII/1400-MDT-4	J-SPA-HCV-45	Aux Bldg	100'			
			J-SPA-HCV-47	Aux Bldg	100'			
			J-SPB-HCV-46	Aux Bldg	100'			
			J-SPB-HCV-48	Aux Bldg	100'			
			J-CPA-UV-2A	Aux Bldg	140'			
			J-CPA-UV-2B	Containment	140'			
			J-CPB-UV-3A	Containment	140'			
			J-CPB-UV-3B	Aux Bldg	140'			
			J-CPA-UV-4A	Aux Bldg	140'			
			J-CPA-UV-4B	Containment	140'			
			J-CPB-UV-5A	Containment	140'			
			J-CPB-UV-5B	Aux Bldg	140'			
J691	Pressure Relief Valves (Target Rock)	76Q-001	J-EWA-PSV-047	Aux Bldg	70'	3580	Completed	30 days
			J-EWB-PSV-048	Aux Bldg	70'			
		76Q-002	J-EWA-PSV-103	Aux Bldg	120'			
			J-EWB-PSV-104	Aux Bldg	51'-6"			

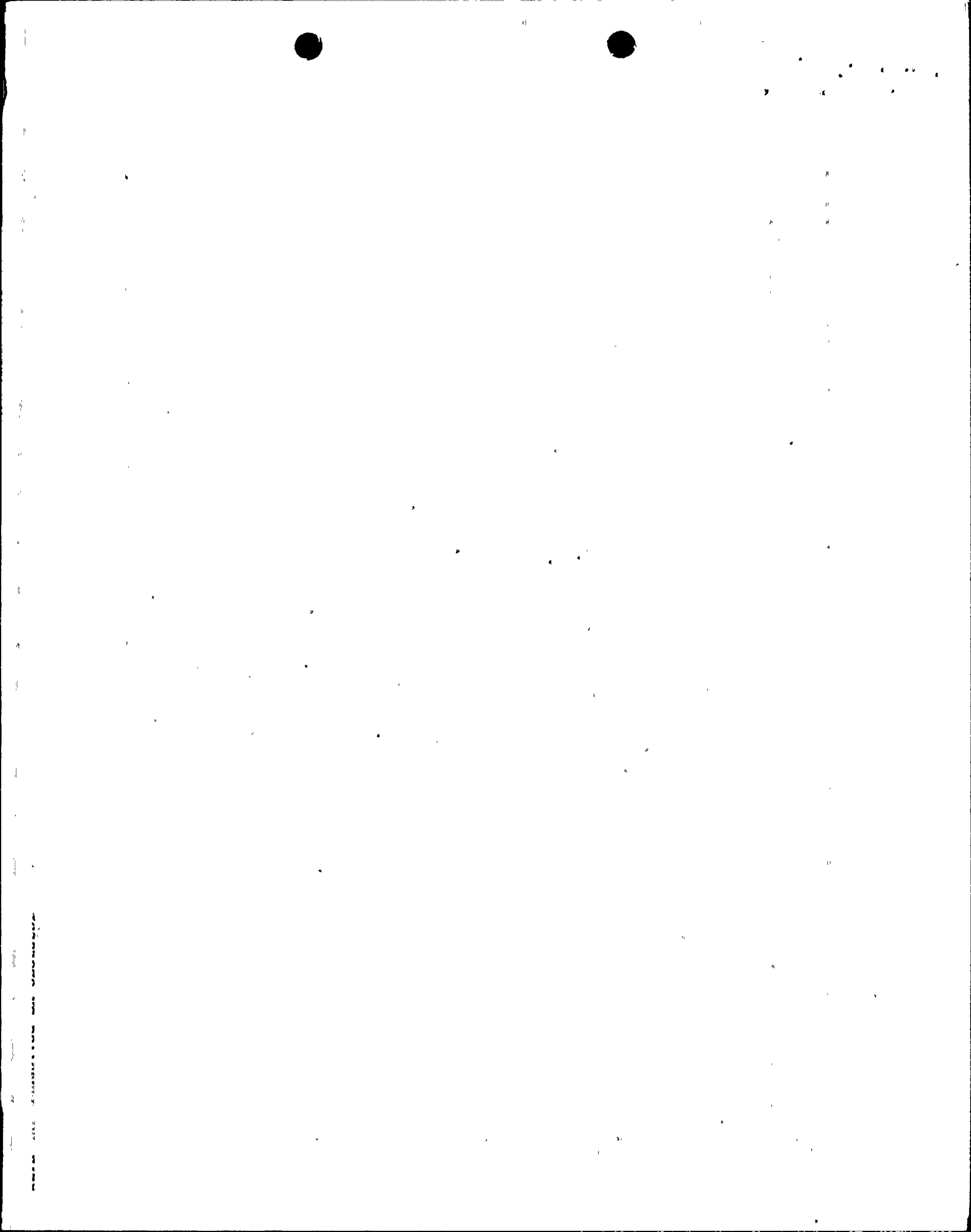


TABLE 1
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
BOP EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
J691	Pressure Relief Valves (Target Rock)	76Q-003	J-EWA-PSV-105	Aux Bldg	120'	3580	Completed	30 days
		76Q-006	J-EWB-PSV-106	Aux Bldg	120'			
			J-ECA-PSV-099	Aux Bldg	120'			
			J-ECA-PSV-101	Aux Bldg	70'			
			J-ECA-PSV-103	Aux Bldg	51'-6"			
			J-ECA-PSV-105	Aux Bldg	51'-6"			
			J-ECA-PSV-107	Aux Bldg	51'-6"			
			J-ECB-PSV-100	Aux Bldg	100'			
			J-ECB-PSV-102	Aux Bldg	70'			
			J-ECB-PSV-104	Aux Bldg	51'-6"			
			J-ECB-PSV-106	Aux Bldg	51'-6"			
			J-ECB-PSV-108	Aux Bldg	51'-6"			
			J-ECB-PSV-109	MSSS	Below 100'			
		76Q-007	J-ECA-PSV-117	MSSS	Below 100'			
		76Q-008	J-SGA-PSV-312	MSSS	Above 100'			
			J-SGA-PSV-319	MSSS	Above 100'			
			J-SGB-PSV-305	MSSS	Above 100'			
		76Q-010	J-SGB-PSV-325	MSSS	Above 100'			
			J-SGA-PSV-310	MSSS	Above 100'			
			J-SGA-PSV-317	MSSS	Above 100'			
			J-SGB-PSV-303	MSSS	Above 100'			
			J-SGB-PSV-323	MSSS	Above 100'			
		76Q-009	J-SGA-PSV-309	MSSS	Above 100'			
			J-SGA-PSV-316	MSSS	Above 100'			
			J-SGB-PSV-302	MSSS	Above 100'			
			J-SGB-PSV-322	MSSS	Above 100'			
			J-SPA-PSV-029	Aux Bldg	100'			
			J-SPB-PSV-030	Aux Bldg	100'			
M021	Aux FW Pumps & (Bingham-Willamette)	4X6X10-1/2BMSD	M-AFA-P01	MSSS	Below 100'	M021-187	In Progress	30 days
		GS-2N	M-AFA-K01	MSSS	Below 100'	M021-211	In Progress	
		4X6X10-1/2BMSD	M-AFB-P01	MSSS	Below 100'	M021-187	In Progress	
		4"-900#	M-AFA-HV-54	MSSS	Below 100'	M021-204	In Progress	
M071	Heat Exchangers (Struthers Wells)	590-480	M-EWA-E01	Aux Bldg	100'	M071-63	Completed	30 days
		32-240	M-EWB-E01	Aux Bldg	100'			
			M-PCA-E01	Fuel Bldg	100'			
			M-PCA-E01	Fuel Bldg	100'			

TABLE 1
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
BOP EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
M093	Pumps (Ingersoll-Rand)	16X235 8X17A	M-EWA-P01 M-EWB-P01 M-PCA-P01 M-PCB-P01	Aux Bldg Aux Bldg Fuel Bldg Fuel Bldg	70" 70" 100' 100'	NES26365	Completed	30 days
M105	Tanks (PX-Engineering)	Custom Built	M-EWA-T01 M-EWB-T01 M-SGA-X01A M-SGA-X01B M-SGB-X01A M-SGB-X01B	Aux Bldg Aux Bldg MSSS MSSS MSSS MSSS	120' 120' Above 100' Above 100' Above 100' Above 100'	NES26371	Completed	30 days
M234A	Main Steam Isolation Valves (Anchor-Darling)	Custom Built	J-SGE-UV-170 J-SGE-UV-171 J-SGE-UV-180 J-SGE-UV-181	MSSS MSSS MSSS MSSS	Above 100' Above 100' Above 100' Above 100'	M234A-68	In Progress	30 days
M234A	FW Isolation Valves (Anchor-Darling)	Custom Built	J-SGA-UV-174 J-SGA-UV-177 J-SGB-UV-132 J-SGB-UV-137	MSSS MSSS MSSS MSSS	Above 100' Above 100' Above 100' Above 100'	M234A-68	In Progress	30 days
M598	Pneumatic Oper. and Damper Assembly (Waldinger)	656, CDR-92	M-HAA-M04 M-HAA-M05 M-HAA-M214 M-HAA-M216 M-HAB-M04 M-HAB-M05 M-HAB-215 M-HAB-217 M-HAA-M01 M-HAA-M02 M-HAA-M03 M-HAA-M06 M-HAB-M02 M-HAB-M03 M-HAB-M06	Aux Bldg Aux Bldg MSSS MSSS Aux Bldg Aux Bldg MSSS MSSS Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg	77' 77' Below 100' Below 100' 77' 77' Below 100' Below 100' 88' 100' 100' 100' 100' 100' 100'	M598-1712, 1715	In Progress	30 days

8270-00-100-01

SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
M598	Pneumatic Oper. and Damper Assembly (Waldinger) Damper	656, CDR-92 CDR-92	M-HFA-M01 M-HFA-M02 M-HFA-M03 M-HFA-M04 M-HFB-M01 M-HFB-M02 M-HFB-M03 M-HFB-M04 M-HFA-M05 M-HFA-M06 M-HFB-M05 M-HFB-M06 M-HPA-M01 M-HPA-M02 M-HPB-M01 M-HPB-M02 M-HFA-M07 M-HFB-M07	Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Fuel Bldg Fuel Bldg	140' 140' 140' 140' 140' 140' 140' 140' 100' 100' 100' 100' 100' 100' 100' 100' 100' 100'	M598-1712, 1715 In Progress	30 days	
M721A	Air Handling Units (American Air Filter)	H9LPACYA H6LPACYA H9LPACYA H6LPACYA H9LPACYA	M-HAA-Z01 M-HAA-Z02 M-HAA-Z03 M-HAB-Z01 M-HAB-Z02 M-HAB-Z03 M-HAA-Z05 M-HAB-Z05 M-HAA-Z06 M-HAB-Z06 M-HAA-Z04 M-HAB-Z04	Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg MSSS MSSS	70' 70' 70' 70' 70' 70' 88' 88' 136' 115' Below 100' Below 100'	NES 26410 In Progress	30 days	
M721B	Air Filtration Unit (CTI)	Custom Built	M-HFA-J01 M-HFB-J01	Fuel Bldg Fuel Bldg	100' 100'	NES 26407	In Progress	30 days

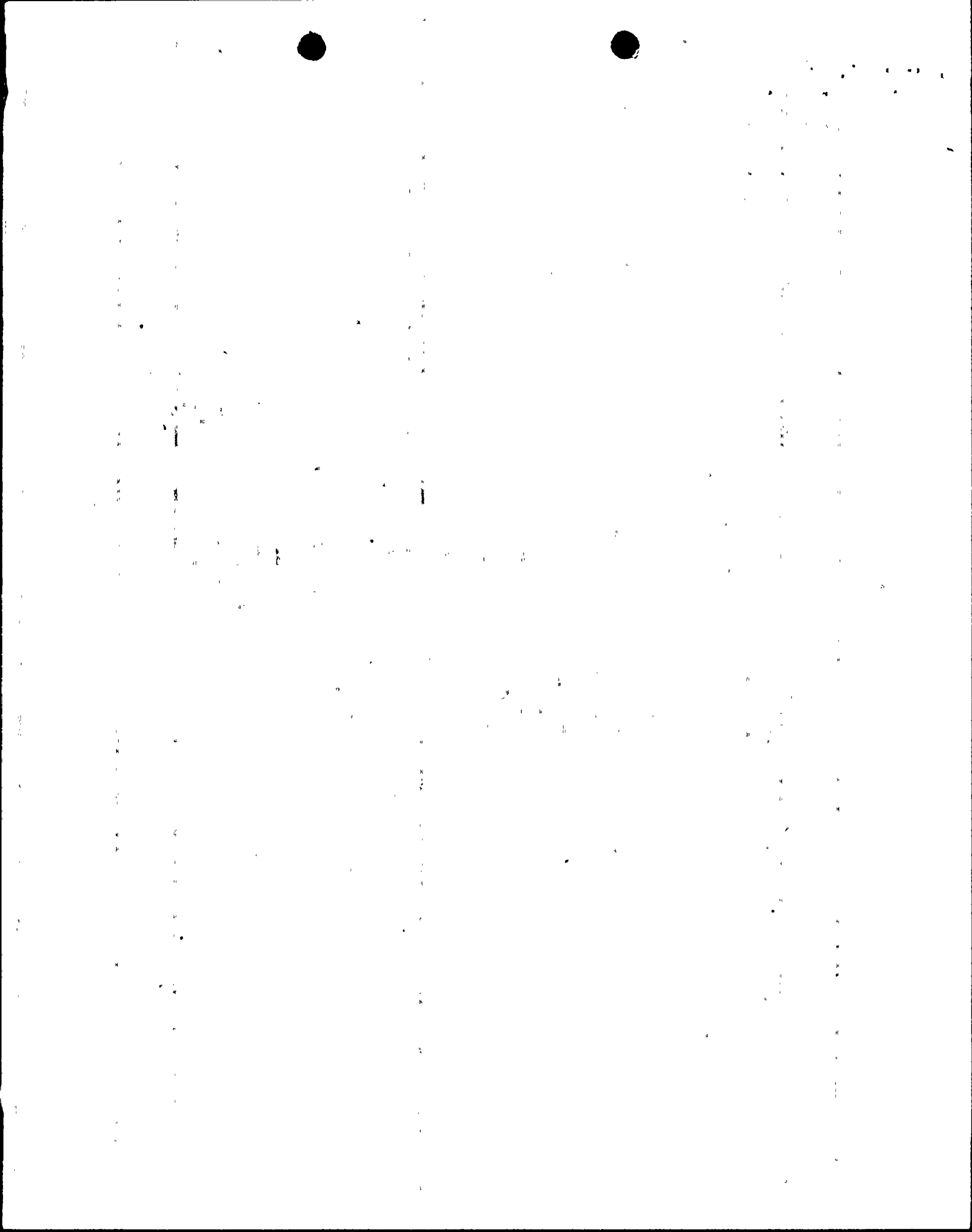


TABLE 1
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
BOP EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
P221A	Nuclear Service Valves 2" and Smaller (Dresser)	5500W	J-GRA-UV-1	Containment	90'	NES 26364	Completed	30 days
			J-HPA-UV-1	Containment	90'			
			J-HPA-UV-3	Aux Bldg	88'			
			J-HPA-UV-5	Aux Bldg	88'			
			J-HPB-UV-2	Containment	90'			
			J-HPB-UV-4	Aux Bldg	88'			
	Manual Valves	5500W	J-HPB-UV-6	Aux Bldg	88'			
			Various	Various	Various			
			950W	Various	Various			
			7150W	Various	Various			
P221B	Nuclear Services Valves 2-1/2" & Larger- Power Operated (Anchor Darling)	6"-400#CS Gate	J-AFA-UV-37	MSSS	Below 100'	NES 26364	Completed	30 days
			J-AFA-UV-36	MSSS	Below 100'			
			J-AFB-UV-34	MSSS	Below 100'			
			J-AFB-UV-35	MSSS	Below 100'			
			J-SGA-UV-134	MSSS	Above 100'			
		6"-900#CS Gate	J-SGA-UV-138	MSSS	Above 100'			
		8"-900#CS Gate	J-SGA-UV-172	MSSS	Above 100'			
		8"-900#CS Gate	J-SGA-UV-175	MSSS	Above 100'			
		6"-900#CS Gate	J-SGA-UV-500S	MSSS	Above 100'			
		8"-900#CS Gate	J-SGB-UV-130	MSSS	Above 100'			
		8"-900#CS Gate	J-SGB-UV-135	MSSS	Above 100'			
		6"-900#CS Gate	J-SGA-UV-500Q	MSSS	Above 100'			
		4"-900#CS Gate	J-SGE-UV-169	MSSS	Above 100'			
		4"-900#CS Gate	J-SGE-UV-183	MSSS	Above 100'			
		6"-900#CS Gate	J-RDA-UV-23	Containment	90'			
		6"-900#CS Gate	J-SGA-UV-500P	Containment	100'			
		6"-900#CS Gate	J-SGB-UV-500R	Containment	100'			
		6"-900#CS Gate	J-SGE-HV-41	Containment	109'			
		6"-900#CS Gate	J-SGE-HV-42	Containment	109'			
		6"-900#CS Gate	J-SGE-HV-43	Containment	109'			
		6"-900#CS Gate	J-SGE-HV-44	Containment	109'			
		10"-150#CS Gate	J-WCB-UV-61	Containment	90'			
		3"-150#SS Gate	J-RDB-UV-24	Aux Bldg	88'			
		10"-150#CS Gate	J-WCA-UV-62	Aux Bldg	90'			
		10"-150#CS Gate	J-WCB-UV-63	Aux Bldg	90'			

TABLE 1
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
BOP EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
P221B	Manual Gate, Globe, Check, Tilt Disc Valves (Anchor Darling)	Various	Various	Various	Various	NES 26364	Completed	30 days
P221C	Y Globe Valves (Kerotest Mfg. Co.) Y Check Valves Y Globe Valves	3/4"-1500#SS 1"-600#SS 2"-1500#SS 1"-1500#CS 3/4"-1500#CS 1"-600#CS 1"-1500#CS 1"-1500#SS 1"-600#CS 1/2"-1690SS	Various Various Various Various Various Various Various Various Various Various	Containment Aux Bldg Containment Containment Containment Containment MSSS Containment MSSS Containment	Various Various Various Various Various Various Various Various Various Various	NES 26388	Completed	30 days
P231	Diaphragm Valves (ITT Grinnell Corp)	10"-150# SS 8"-150# SS 10"-150# SS 8"-150# SS 4"-150# SS 3"-150# SS 2-1/2"-150# CS 2"-150# SS 3"-150# SS 1"-150# SS 4"-150# SS	P-PCA-V011 P-PCA-V014 P-PCA-V015 P-PCA-V027 P-PCB-V018 P-PCB-V019 P-PCB-V026 P-PCB-V069 P-PCE-V028 P-PCN-V036 P-PCN-V215 P-SPA-V037 P-SPA-V096 P-SPB-V024 P-SPB-V095 P-CHN-V093 P-CHN-V094 P-CHN-V095 P-CHN-V976 P-CHN-V001 PCHE-VX01 P-CHE-VX02 P-PCN-V024	Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Aux Bldg Fuel Bldg Fuel Bldg Fuel Bldg Fuel Bldg	100' 100' 100' 100' 100' 100' 100' 100' 100' 100' 100' 100' 100' 100' 100' 100' 131' 131' 131' 131' 100' 95' 95' 100'	W-198	In Progress	30 days

TABLE 1
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
BOP EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG NO.	LOCATION	ELEVATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
C153	Personnel Air Locks (W. J. Wooley)	Custom Built Custom Built	N/A N/A	Containment Containment	104' 144'	NES 26398	In Progress	1 year
C174	Spent Fuel Pool Gate Fuel Transfer Canal Gate Cask Loading Pit Gate (PX-Engineering)	583B 583B 583B	N/A N/A N/A	Fuel Bldg Fuel Bldg Fuel Bldg	140' 140' 140'	NES 26409	Completed	40 years
J359	Hydrogen Monitors (Comsip Delphi)	KIII KIII	J-HPA-E02 J-HPB-E02	Aux Bldg Aux Bldg	120' 100'	J359-38	Completed	1 year
N993	Hydrogen Recombiners (Rockwell)	None None	AN-HPA-001 AN-HPB-001	Aux Bldg Aux Bldg	100' 100'	None	In Progress	1 year

TABLE 2
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
NSSS EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-701	Safety Valve (Dresser)	6-31709N Dwg 3NC-045	RC-200 RC-201 RC-202 RC-203	Containment	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77720	RC-244	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 446KDA3-001	RC-130 RC-131	Containment	Later	In Progress	30 Days
14273-PE-701	Safety Valve (Dresser)	Dwg 3NC-046	SG-554 SG-557 SG-560 SG-573 SG-576 SG-579 SG-694 SG-555 SG-558 SG-561 SG-574 SG-577 SG-691 SG-695 SG-556 SG-559 SG-572 SG-575 SG-578 SG-692	MSSS	Later	In Progress	30 Days

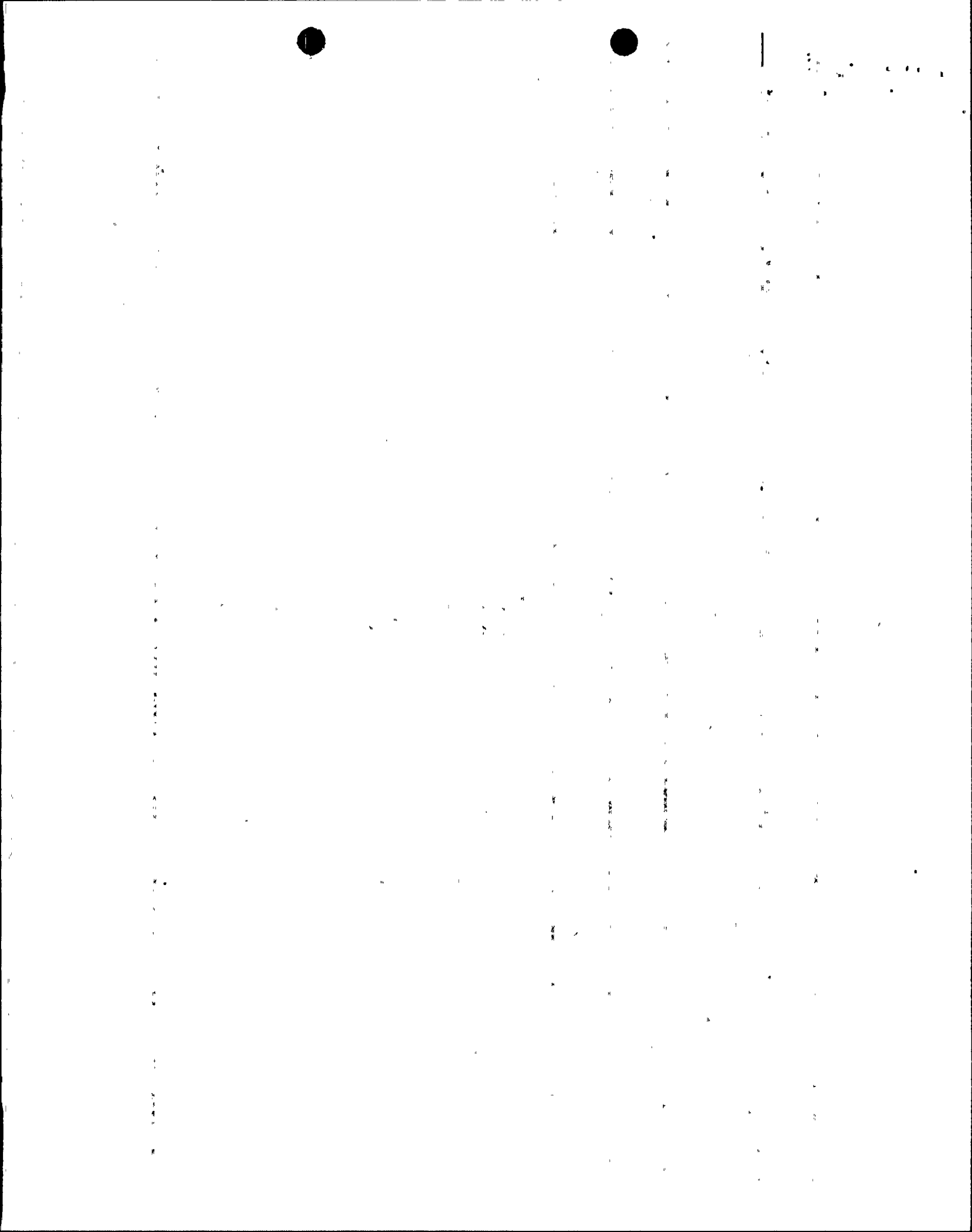


TABLE 2
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
NSSS EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77710	CH-118	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77680-1	CH-190	AUX	Later	In Progress	30 Days
14273-PE-711	Solenoid Operated Valve (Target Rock)	Dwg 2SMH-S-1	CH-203 CH-205	Containment	Later	In Progress	30 Days
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6460	CH-240	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 83110	CH-255	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77880-1	CH-305 CH-306	AUX	Later	In Progress	30 Days
14273-PE-717	Lift Check Valve (Borg Warner)	Dwg 81630	CH-328 SI-424 CH-331 SI-426 CH-334 SI-448 CH-429 SI-451 CH-433 SI-486 CH-440 SI-487	AUX	Later	In Progress	30 Days
14273-PE-717	Lift Check Valve (Borg Warner)	Dwg 81630-2	CH-431	Containment	Later	In Progress	30 Days
14273-PE-717	Lift Check Valve (Borg Warner)	Dwg 82140	CH-494	Containment	Later	In Progress	30 Days
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6462	CH-505	AUX	Later	In Progress	30 Days

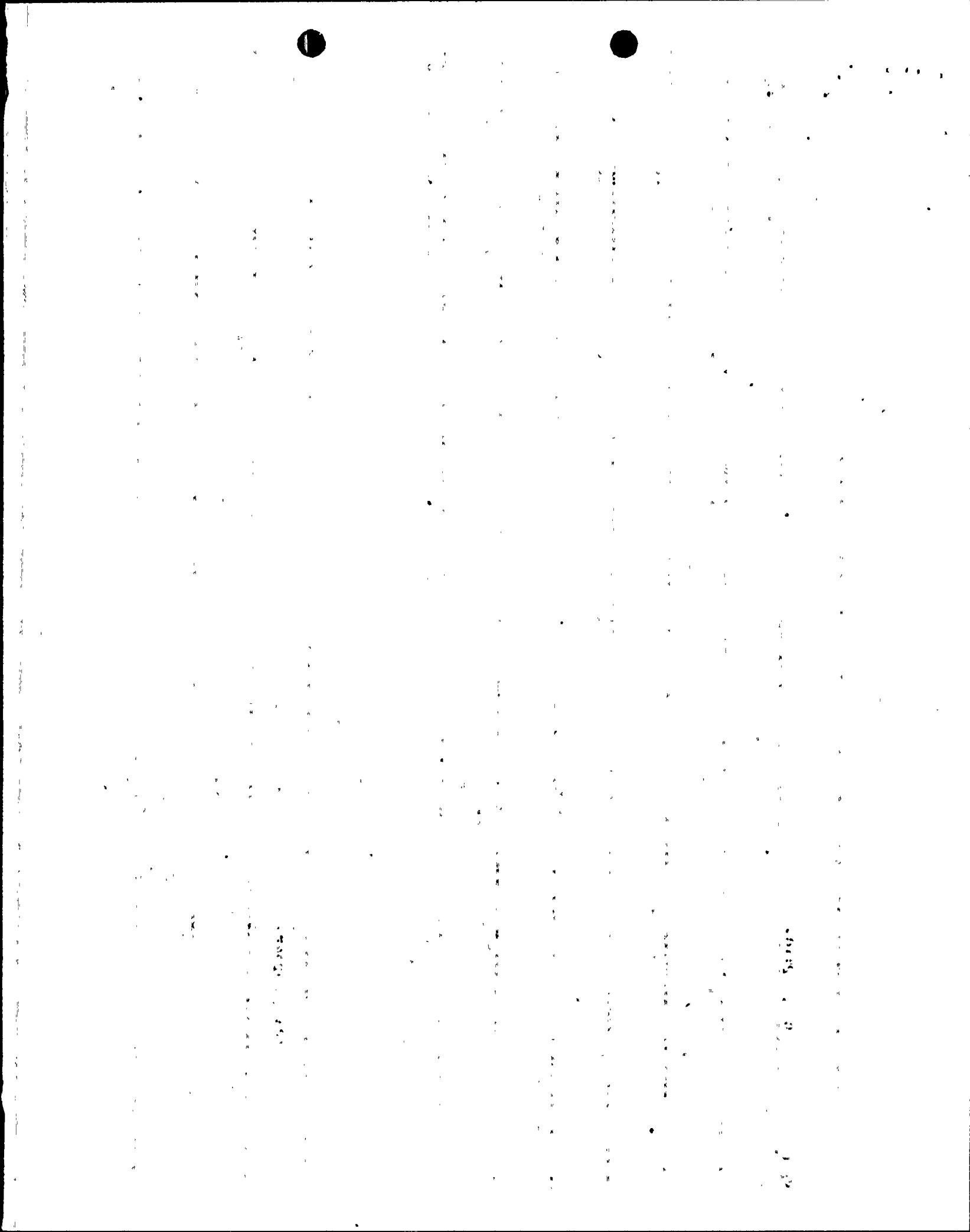


TABLE 2
PVNGS MECHANICAL EQUIPMENT QUALIFICATION PROGRAM STATUS
NSSS EQUIPMENT

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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6461	CH-515 CH-516	Containment	Later	In Progress	30 Days
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6466	CH-523	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77610	CH-524	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77890-1	CH-530 CH-531	AUX	Later	In Progress	30 Days
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6474	CH-560	Containment	Later	In Progress	30 Days
14273-PE-704A	Pneumatic Operated Valve (Borg Warner)	Dwg 83120	CH-580	AUX	Later	In Progress	30 Days
14273-PE-717	Lift Check Valve (Borg Warner)	Dwg 81610-1	CH-787 CH-807 CH-866 CH-868 CH-802 CH-812 CH-867 CH-869	Containment	Later	In Progress	30 Days
14273-PE-717	Lift Check Valve (Borg Warner)	Dwg 81620	CH-835	Containment	Later	In Progress	30 Days
14273-PE-711	Solenoid Operated Valve (Valcor Engineering)	Dwg V526-5683-7	SC-200 SC-201	Aux	Later	In Progress	30 Days

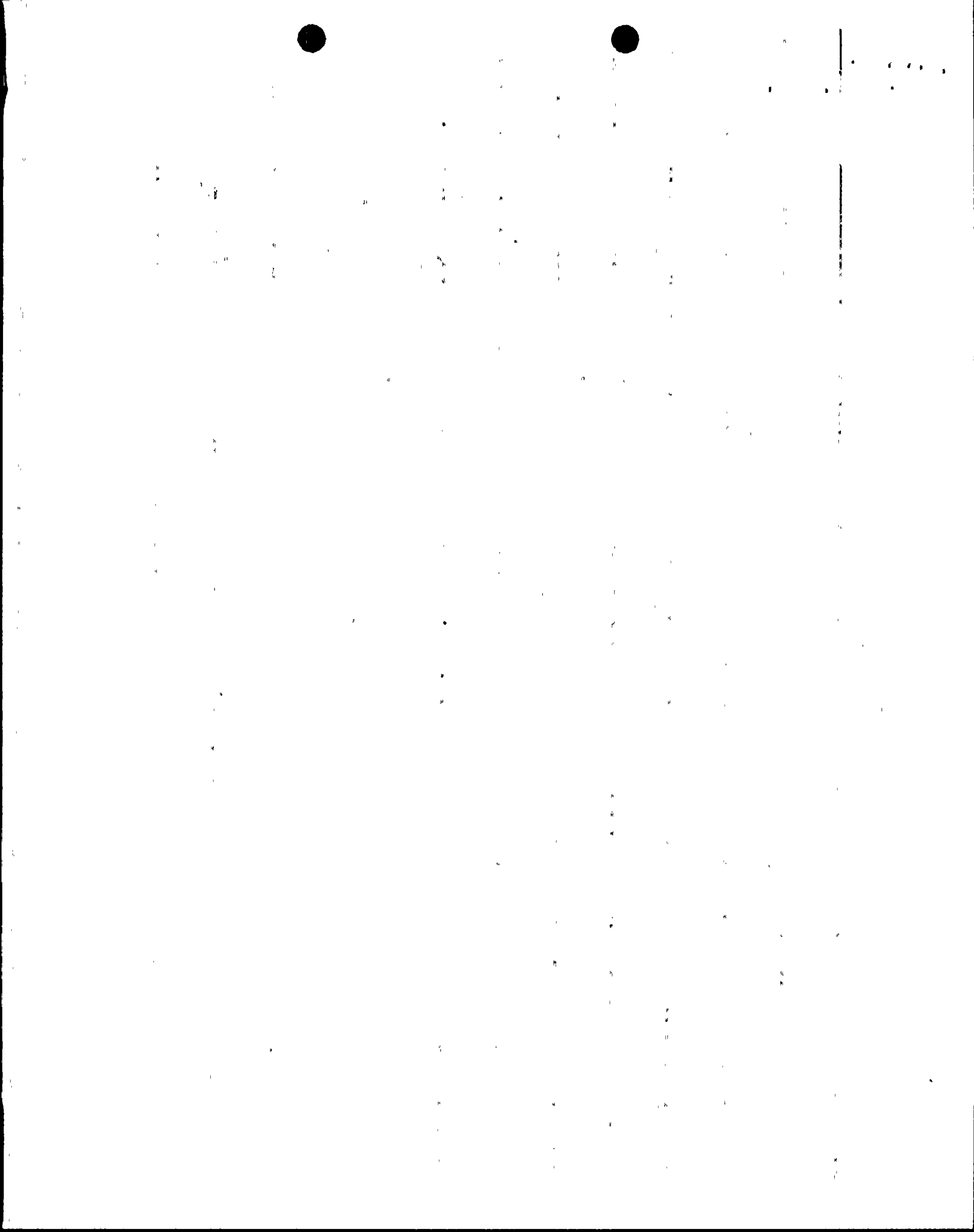


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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
4273-PE-711	Solenoid Operated Valve (Valcor Eng.)	Dwg V-526-5683-5	SC-219 SC-221 SC-223 SC-225 SC-227 SC-228	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77860	SI-157 SI-158	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77880-1	SI-200 SI-201	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77900	SI-205 SI-206	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 79520	SI-306 SI-307 SI-690 SI-691	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 79120	SI-404	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 79120-1	SI-405	AUX	Later	In Progress	30 Days

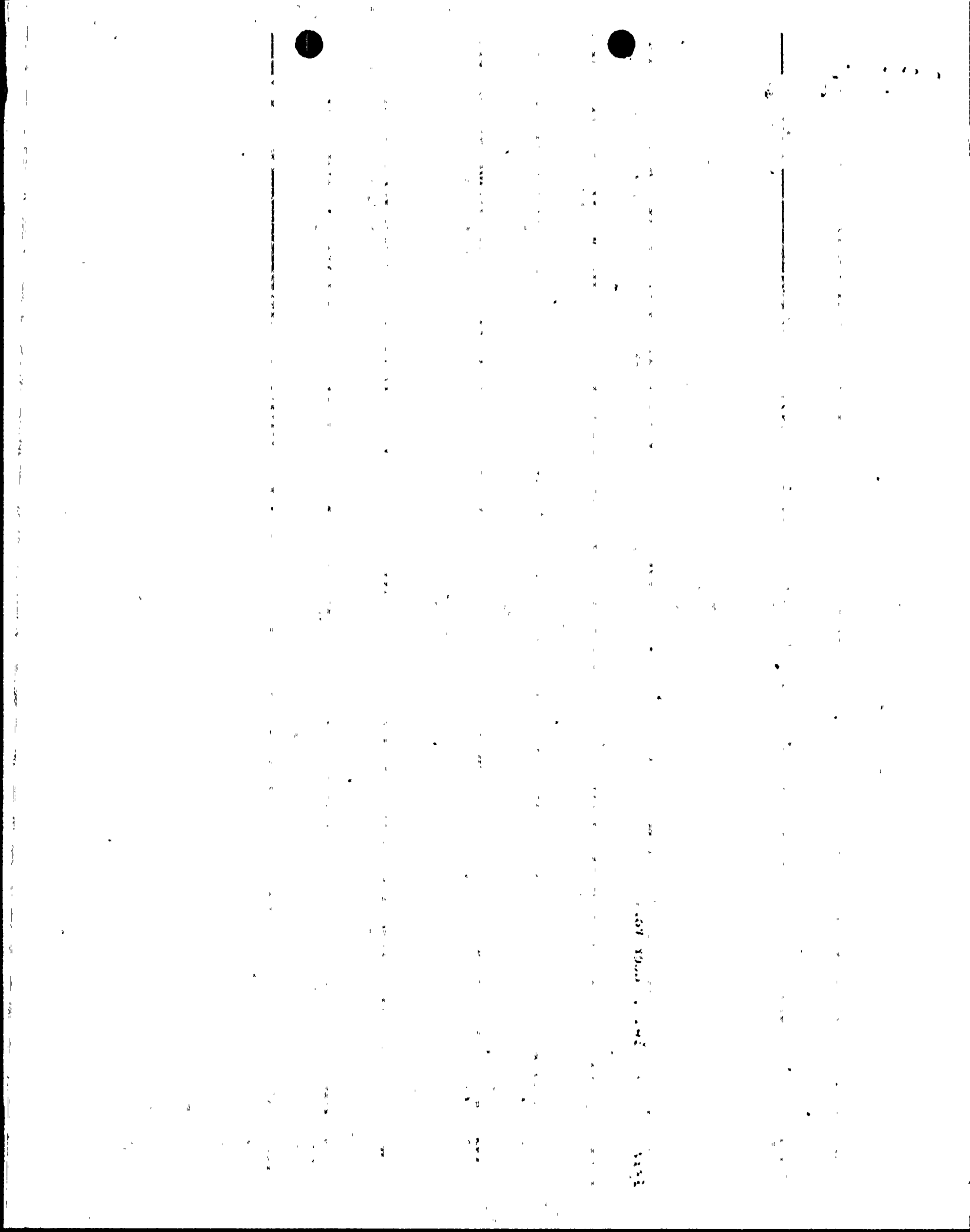


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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77760-1	SI-434 SI-446 SI-484 SI-485	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77910	SI-604 SI-609	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Butterfly Valve (Posi Seal Intl)	Dwg 14336-2	SI-657 SI-658	AUX	Later	In Progress	30 Days
14273-PE-711	Solenoid Operated Valve (Target Rock)	Dwg 4SMH-S-1	SI-659 SI-660	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77620	SI-664 SI-665	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77620-4	SI-666 SI-667	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77620-1	SI-668 SI-669	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 79510	SI-671 SI-672	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Butterfly Valve (Posi Seal, Intl)	Posi Seal Intl. Dwg 14336-3	SI-673 SI-675	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Butterfly Valve (Posi Seal Intl)	Dwg 14336-4	SI-674 SI-676	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Butterfly Valve (Posi Seal Intl)	Dwg 14336-1	SI-678 SI-679	AUX	Later	In Progress	30 Days

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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6471	SI-682	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77890	SI-683 SI-692	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77780	SI-684 SI-685 SI-687 SI-688 SI-689 SI-693 SI-694 SI-695	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77890-2	SI-686 SI-696	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77740-1	SI-698	AUX	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77740	SI-699	AUX	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77700	SI-113 SI-123 SI-133 SI-143 SI-522 SI-523 SI-532 SI-533	Containment	Later	In Progress	30 Days

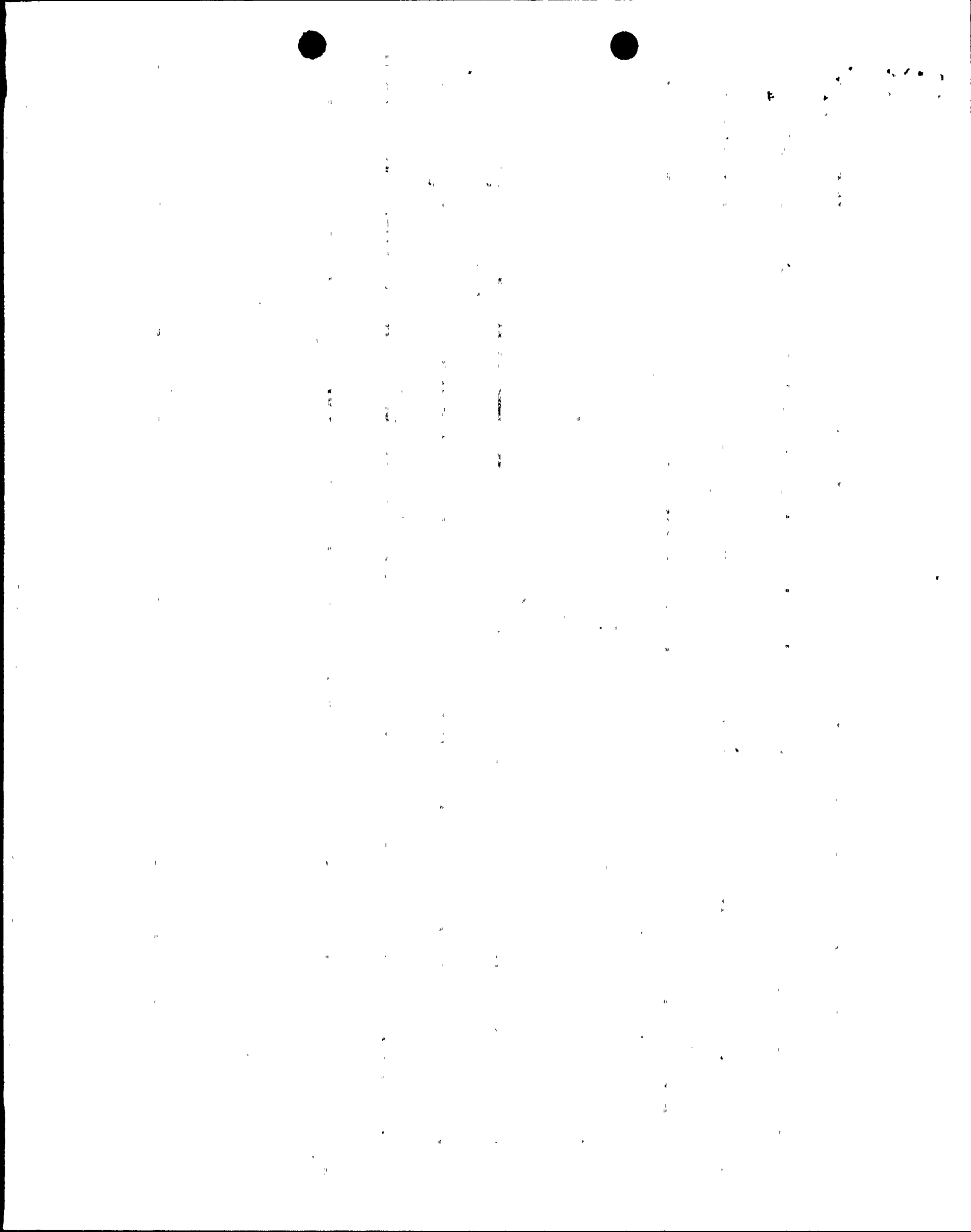


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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77790	SI-114 SI-124 SI-134 SI-144	Containment	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77760	SI-164 SI-165	Containment	Later	In Progress	30 Days
14273-PE-715	Miscellaneous Relief Valve (Crosby)	Dwg DS-C-61181	SI-179 SI-189	Containment	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77810	SI-215 SI-217 SI-225 SI-227 SI-235 SI-237 SI-245 SI-247	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 79530	SI-321 SI-331	AUX	Later	In Progress	30 Days
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6458	SI-322 SI-332	Containment	Later	In Progress	30 Days
14273-PE-710	Swing Check Valve (Borg Warner)	Dwg 77790-1	SI-540 SI-541 SI-542 SI-543	Containment	Later	In Progress	30 Days

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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-711	Solenoid Operated Valve (Target Rock)	Dwg ISMS-S-4	SI-605 SI-606 SI-607 SI-613 SI-623 SI-633 SI-643	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77840	SI-614 SI-624 SI-634 SI-644	Containment	Later	In Progress	30 Days
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6470	SI-611 SI-621 SI-631 SI-641	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 79540	SI-615 SI-625 SI-635 SI-645	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77620-2	SI-616 SI-617 SI-626 SI-627 SI-636 SI-637 SI-646 SI-647	AUX	Later	In Progress	30 Days

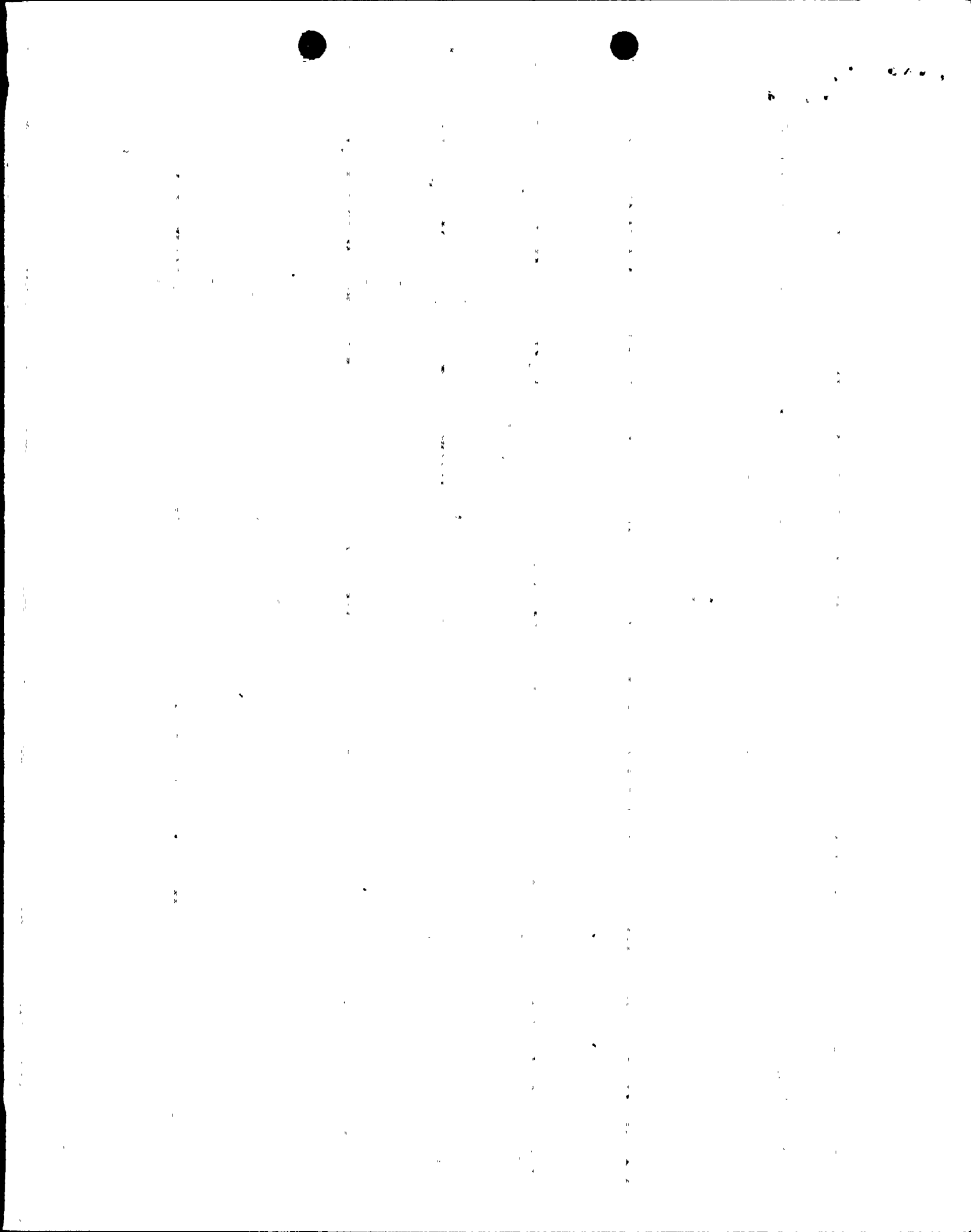


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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6459	SI-618 SI-628 SI-638 SI-648	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77850	SI-651 SI-652	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77850-1	SI-653 SI-654	Containment	Later	In Progress	30 Days
14273-PE-705	Motor Operated Valve (Borg Warner)	Dwg 77850-2	SI-655 SI-656	AUX	Later	In Progress	30 Days
14273-PE-717	Vacuum Breaker Valve (Valcor Eng)	Dwg V520-04-4	IR-100 IR-118	AUX	Later	In Progress	30 Days
14273-PE-713	Spring Loaded Operated Valve (Dragon)	Dwg 13005	IR-120 IR-130	AUX	Later	In Progress	30 Days
14273-PE-711	Solenoid Operated Valve (Valcor Eng)	Dwg V526-5292-29-1	IR-602 IR-603	AUX	Later	In Progress	30 Days
14273-PE-711	Solenoid Operated Valve (Valcor Eng)	Dwg V526-5292-17-1	IR-680 IR-681	AUX	Later	In Progress	30 Days
14273-PE-711	Solenoid Operated Valve (Valcor Eng)	Dwg V526-5683-6	SS-200 SS-201 SS-202	AUX	Later	In Progress	30 Days
14273-PE-711	Solenoid Operated Valve (Valcor Eng)	Dwg 208160002	SS-203 SS-204 SS-205	Containment	Later	In Progress	30 Days

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SPEC.	DESCRIPTION	MODEL	TAG. NO.	LOCATION	REPORT NO.	STATUS	REQUIRED OPERATING TIME
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6462	CH-506	Containment	Later	In Progress	30 Days
14273-PE-704	Pneumatic Operated Valve (Fisher Controls)	Dwg 54A6474	CH-561	AUX	Later	In Progress	30 Days
14273-PE-701	Power Operated Relief Valve Garrett Corp.	Dwg 3750042	RC-132 RC-133	Containment Warehouse	Later	In Progress	30 Days
14273-PE-410	High Pressure Safety Injection Pump Ingersoll Rand	4X11CA-8	NONE	Aux. Bldg.	Later	In Progress	30 Days
14273-PE-410	Low Pressure Safety Injection Pump (Ingersoll Rand)	8X20WDF	NONE	Aux. Bldg.	Later	In Progress	30 Days
14273-PE-410	Containment Spray Pump (Ingersoll Rand)	8X23WDF	NONE	Aux. Bldg.	Later	In Progress	30 Days
14273-PE-403	Charging Pump (Gaulin Corp)	NP18-31TFS	NONE	Aux. Bldg.	Later	In Progress	30 Days
14273-PE-412	Spray Chemical Addition Pump (Union)	7/8X2-1/4 5X3	NONE	Aux. Bldg.	Later	In Progress	30 Days

