COOPER NUCLEAR STATION

BROWNVILLE, NEBRASKA

ANNUAL OPERATING REPORT

JANUARY 1, 1982 THROUGH DECEMBER 31, 1982

USNRC DOCKET 50-298

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I. PERFORMANCE CHARACTERISTICS AND TESTS

FUEL PERFORMANCE

Off-gas activity in the January 1 through May 21, 1982 operational period showed no increases indicative of fuel failures. The off-gas activity level continued at various steady state levels from January 1 to May 21, 1982 with the release rates being well within the limits specified in the CNS Technical Specifications.

During the period from May 21, 1982 through July 7, 1982, the reactor was shut down and the reactor vessel disassembled for the scheduled refueling and maintenance outage. The core was loaded per the loading plan developed by CNS for Cycle VIII; 112 spent fuel assemblies were removed and replaced with 112 new fuel assemblies. A normal incore shuffle plan was used to load the fuel in the reactor. In concurrence with General Electric, sipping for leaking fuel assemblies was not warranted due to the low off-gas activity. After the reactor core loading was completed, the fuel loading was verified as correct in accordance with the General Electric loading plan for Cycle VIII and the results recorded on video tape.

A 10CFR50.59 Reportability Analysis for Cycle 8 was performed and approved by the Licensing Manager and by the District safety review committees. NRC review and approval was not necessary.

On July 7, 1982, the reactor was started up and the startup physics test program was initiated. One hundred percent thermal power was initially achieved for Cycle VIII on July 25, 1982. From July 7, 1982 through December 31, 1982, an essentially steady state off-gas activity was monitored. This activity indicates a very small number (or severity) of leaking fuel pins in the reactor.

Comparisons of the actual control rod density during the period January 1 to December 31, 1982, to the control rod density predicted by computer programs at various core average exposures indicated reactivity anomalies less than 1% $\Delta K/K$.

The startup physics test program was completed on September 7, 1982.

MSV AND MSRV FAILURES AND CHALLENGES
(Ref: NUREG-0737, Action Item II.K.3.3)

There were two challenges to the relief valves during the March 20, 1982 scram. Both valve actuations were satisfactory.

There was a single challenge to the relief valves during the September 4, 1982 scram. Valve actuation was satisfactory.

There were five challenges to the relief valves during the October 5, 1982 scram. All valve actuations were satisfactory.

All SRV solenoids had type 302 stainless steel return springs which were replaced with Inconel 718 springs during the May - July 1982 refueling outage. This was incorporated due to relaxation of the 302 stainless steel which caused a downward drift in dropout pressure as the material aged. This problem was reported in LER 81-24. See MDC 82-36 (page 12).

REPORTABLE SPECIAL PROCEDURES/SPECIAL TEST PROCEDURES

SP 81-7

Procedure: This special procedure is for visual inspection of the core spray spargers to locate any indications of cracking.

Description: This procedure was written based on information supplied in GE SIL 289 and NRC IE Bulletin No. 80-13. This followed the discovery of core spray sparger cracking at two other nuclear plants. It involved lowering a television camera into the vessel to check the core spray piping and components for missing, broken or damaged equipment or any other abnormalities. If any were found they were to be recorded on video tape. The results of the procedure were satisfactory with no reportable indications.

Safety Analysis: This special procedure is a visual examination and does not alter any equipment or previous analyses. The procedure authorizes no changes to the facility and therefore has no affect on the margin of safety.

STP 82-4

Procedure: This test procedure is used for pressure testing Class II Nuclear Systems as required by ASME Section XI Summer 1975 Addenda for the Inservice Inspection (ISI) program.

Description: ASME Section XI requires a hydrostatic test of 1.25 times the system design pressure on a part of Class II N systems by the end of each inspection interval. The Class II systems in this category are as follows:

1. RCIC (Pump Suction)
2. RCIC (Steam Condensing Mode Portion)
3. Reactor Feedwater
4. HPCI (Aux. Cooling Supply Portion)

An exemption has been granted to allow testing the above systems at ambient temperature. This has been allowed because all subject systems are carbon steel and not austenitic steel which Code had specified a 100°F minimum test temperature. The Reactor Feedwater and HPCI systems were hydrostatically tested during the 1982 refueling outage as specified in the ISI program mentioned above. The RCIC system will be tested during the 1983 refueling outage.

STP 82-4 (cont.)

Safety Analysis: This testing will be conducted in accordance with ASME Section XI ISI requirements. No changes are being made to any safety related equipment. System hydros will be conducted during station shutdown and Inservice Leak Testing will be conducted with existing station surveillance procedures. This testing will not affect the existing system margins of safety but will verify existing system integrity and leak tightness.

STP 82-9

Procedure: This test procedure was to determine the difference between two-loop and single-loop effective drive flow at the same core flow.

Description: The results of this test were used in determining the magnitude of the correction that must be applied to the APRM gain adjustment settings when in extended (greater than 24 hours) single loop operation. The results were sent to the NRC in a letter from J. M. Pilant to D. B. Vassallo dated May 6, 1982, "Single Loop Operation - Response to NRC Questions". The test findings were based on conservative input and were adequate to revise CNS Nuclear Performance Evaluation Procedure 10.1, APRM Calibration. An APRM gain adjustment setting correction term of 6.73% was determined by this test. At this time, the results will never be used unless single loop operations are approved by the NRC.

Safety Analysis: Since CNS Technical Specifications permit operating the plant in single loop for 24 hours, this test did not require operating the plant in a manner not previously addressed in safety analyses. The plant was operated using existing CNS Operations Procedures and therefore the plant safety analysis is still bounding and the risk of an accident or occurrence is not increased.

STP 82-10

Procedure: This test was used to verify the no flow and full flow differential pressures of the HPCI and RCIC high steam flow detectors.

Description: This test was initiated by NRC IE Bulletin No. 82-16. The high steam flow differential pressure detectors are installed to provide a high steam flow signal to isolate the HPCI or RCIC system in the case of a steam leak. The high steam flow signal is to be set at 300% of normal full flow. The IE Bulletin suggested verifying the setpoint information by reviewing the startup test data. Since the CNS data was incomplete, the no

STP 82-10 (cont.)

flow and full flow differential pressure measurements were retaken. D/P transducers were temporarily connected in parallel with the flow detectors. Measurements recorded indicated there was close agreement with Technical Specification setpoints and that the setpoints were set properly after startup testing. No further action is intended.

Safety Analysis: The test does not remove high steam flow protection. The installation of the transducer will only cause one of two detectors to be temporarily out of service, so automatic isolation is still available. Isolation of one flow detector does not affect the other detector. Both HPCI and RCIC will function as specified in the FSAR for LOCA mitigation as this test does not affect the operation of either system. Therefore this test does not introduce an unreviewed safety question.

STP 82-12

Procedure: This test was used to verify the operability of RWCU-MO-15 after failure of the normal valve position indication logic.

Description: This test was required after the valve failed to show full open indication during Surveillance Procedure 6.3.1.4. Indication of the valve position must be known to verify the valve will fully close within the 60 second Technical Specification time limit when an isolation signal is received. Proper operation of the valve was observed during the test based on Limitorque motor currents, timing the opening and closing cycles and recording pressure changes. RWCU-MO-15 was found to have a closing time of 50 seconds. The limit switch mechanism was repaired at a later unscheduled outage and system conditions were returned to normal.

Safety Analysis: This test was used to demonstrate that RWCU-MO-15 was capable of performing its function of primary containment isolation as required by CNS Technical Specifications. All testing was to be conducted with plant safety systems operable. No new logic was introduced. The valve operation and the existing margin of safety is only being confirmed.

II. FACILITY CHANGES REPORTABLE UNDER 10CFR50.59

REPORTABLE MINOR DESIGN CHANGES (MDC) COMPLETED IN 1982

MDC 77-130-1

Component: Blind Flanges on Scram Discharge Headers

Description: This MDC authorized installation of blind flanges on the ends of the scram discharge headers as recommended by General Electric Service Information Letter No. 223. These flanges permit access for hydrolazing the headers when radiation levels in the area warrant it.

Safety Analysis: This MDC provides a means for reducing radiation in the scram discharge header area. This action complies with the intent of ALARA for radiation exposure to workers. This change does not involve an unreviewed safety question since the original design specifications have been met or exceeded and system operation is unchanged.

MDC 80-48

Component: Solenoid Valves in the Turbine Equipment Cooling (TEC)/Reactor Equipment Cooling (REC) Crosstie and Turbine Equipment Cooling Piping to Plant Air Compressors

Description: This MDC authorized the removal of the solenoid valves in the TEC-REC crosstie and replacement with manual valves. It also authorized the removal of the solenoid valves in the TEC piping for the plant air compressors. The TEC system normally supplied the three air compressors with the REC system as a backup for emergency cooling. Adequate cooling was difficult to achieve with the REC backup cooling system because of restricted flow caused by the REC solenoid valves. Without remote operated solenoid valves in the crosstie it made remote operation of the TEC solenoid valves to the compressors virtually useless. The TEC system will now normally supply compressors B and C, and the REC system will supply compressor A. This will insure the operability of both systems in supplying water to the plant compressors. In addition, each system will still act as a backup to the other through the new manually operated crosstie valves.

Safety Analysis: The REC and TEC systems and the plant air compressors are not essential for a safe plant shutdown. In addition, the REC and TEC systems still act as backups in the event emergency cooling is needed.

MDC 80-90

Component: Check Valves in Scram Discharge Header Vent Path

Description: This MDC authorized installation of a redundant check valve in the vent path of the scram discharge header in the event the existing vacuum breakers fail. They were installed, one per header, in parallel with the existing vacuum breakers in order to meet the requirements of NRC IE Bulletin 80-17.

Safety Analysis: The addition of the redundant check valve will make the system more reliable than the previous design. This change does not involve an unreviewed safety question since redundancy to the existing system is provided, and the changes either met or exceeded original design specifications.

MDC 80-133

Component: Reactor Protection System Protective Circuit

Description: This MDC authorized the addition of two Electrical Protection Assemblies to the RPS power panels A and B feeder circuits. This modification addresses the requirements stated in the letter, Ippolito (NRC) to Pilant (NPPD) dated September 24, 1980, "RPS Protective Circuit Seismic Retrofit". The NRC staff had identified design deficiencies in the RPS MG sets which could have permitted a seismic type failure or an undetectable single component failure. General Electric developed the Electrical Protection Assemblies, two of which were connected in series with each RPS power source, both normal and alternate. Each assembly has its own voltage and frequency trips and if one fails, the other EPA can still function to initiate an automatic scram when a limit is exceeded.

Safety Analysis: The addition of two EPA's to each feeder will provide redundancy to the Reactor Protection System and ensure that RPS buses can be deenergized and the reactor scrammed even under severe operating conditions, including a seismic event. The safety margin will be increased since either of the EPA's can provide protection when bus voltage or frequency limits are exceeded.

MDC 81-64

Component: Main Steam Safety Relief Valve Discharge Piping Supports

Description: This MDC authorized installation of additional supports on the main steam safety relief valve discharge piping system in the drywell. This change is a continuation of the Mark I Containment Program and will assure correct system response during an accident or transient situation.

MDC 81-64 (cont.)

Safety Analysis: This MDC is intended to increase the margin of safety of the initial design of the plant. The supports and components were designed using more conservative loads than originally used, thereby providing a greater factor of safety than previously defined.

MDC 81-83

Component: Cable Expansion Room Smoke Detectors

Description: This MDC authorized the addition of two smoke detectors in the Cable Expansion Room. This insured compliance with the NRC requirements of 10CFR50, Appendix R, Section III.G. The Cable Expansion Room had a sprinkler system for fire mitigation and the additional requirement of Appendix R for smoke detection is now met by this change.

Safety Analysis: This change does not affect the operation of any plant related safety systems. It added to the fire detection capability and will increase plant safety by improving the ability to detect fires before any significant damage can occur.

MDC 82-09/78-16

Component: Torus Drain

Description: This MDC authorized the addition of a permanent, seismically designed drain valve attachment at penetration X213 of the torus. The attachment is blind flanged during normal operation. When the torus needs to be drained the flange is removed and a spoolpiece installed to connect the attachment to a torus drain pump. The pump transfers water into an existing condensate phase separator drain line eventually returning to the condenser hotwell.

Safety Analysis: The components and piping downstream of the blind flange are physically disconnected from the torus during plant operation and do not present an unreviewed safety question. Calculations were performed to ensure the drain valve attachment was adequately restrained for any seismic event.

MDC 82-23

Component: Main Steam Safety Relief Valve Discharge Piping Supports

Description: This MDC authorized the installation of additional supports on the MSRV discharge piping system. See MDC 81-64. This change completes the MSRV requirements identified under the Mark I Program. The new supports were required because the reanalyzed transient loading on the piping system was greater than the original design loads.

Safety Analysis: This MDC will restore this part of the plant to the margin of safety intended in the initial plant design. The support components are designed using more conservative loads than previously evaluated in the original plant design and lower the impact of any previously unevaluated accident consequences.

MDC 82-24

Component: Torus Internal Structures

Description: This MDC authorized modification of various internal torus piping systems and internal torus structural supports. These modifications were required as part of the Mark I Containment Structural Reevaluation Program.

Safety Analysis: This MDC will restore the torus internal components and structures to the original intended safety margin. The modifications made were based on analyses using more conservative loads than were previously evaluated in the original plant design.

MDC 82-26

Component: Torus Column Assembly

Description: This MDC authorized modifications to the torus column anchorage assemblies. This change is required as part of the Mark I project and consisted of reinforcing the double box beam and bracket assemblies. This will reduce the bearing load on the column base plates and provide for more flexural resistance in the beam assemblies. The changes were required following a computer finite element study which predicted the inadequacy of the beam and bracket assemblies to resist torus support column uplifting.

Safety Analysis: This MDC was installed based on the computer findings and will restore the torus column assemblies to equal or greater than the original margin of safety. The modifications meet or exceed previous design specifications and therefore do not present an unreviewed safety question.

MDC 82-36

Component: Safety Relief Valve Solenoids

Description: This MDC authorized the replacement of the return spring in SRV solenoids. The Target Rock solenoids utilized a type 302 stainless steel spring. The springs were replaced with Inconel 718 springs following the failure of an MSRV at Cooper Nuclear Station to reclose after an activation. Target Rock indicated that the industry has experienced a downward drift in the dropout pressure caused by relaxation of the 302 SS spring. The new spring material is not as affected by age and temperature conditions.

Safety Analysis: Inconel is ideal spring material and will minimize the possibility of dropout drift. This change will increase the reliability of the safety relief valves in preventing inadvertent blowdowns. The change does not affect the original valve design or operation and therefore does not present an unreviewed safety question.

MDC 82-61

Component: U-Sump Discharge Piping

Description: This MDC authorized modification of the U-Sump discharge piping so that the effluent can be pumped to the river headwall or to the radwaste system via the V-Sump discharge piping. The U-Sump is classified as a non-radioactive floor drain collection point, but has the potential to become contaminated with leakage from the Turbine Building floor drains and the condenser drain valves. This change will now allow any radioactive water found in U-Sump to be sent to radwaste for processing.

Safety Analysis: Addition of the discharge leg from U-Sump to the radwaste will lessen the probability of an occurrence or accident as previously evaluated in the FSAR. The change is an improvement on the original design since it will decrease the probability of an unauthorized release of contaminated water to the river.

III. PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION

PERSONNEL AND MAN-REM BY WORK AND JOB FUNCTION 1982

Work and Job Function	Number of Personnel (> 100 mRem)			Total Man-Rem		
	Station Employees	Utility Employees	Contractor & Others	Station Employees	Utility Employees	Contractor & Others
REACTOR OPERATIONS & SURV.						
Maintenance Personnel	4	---	1	.947	---	.005
Operating Personnel	46	---	---	29.941	---	---
Health Physics Personnel	14	---	---	9.594	---	---
Supervisory Personnel	10	2	1	4.933	.022	.206
Engineering Personnel	17	10	3	14.133	1.093	.350
ROUTINE MAINTENANCE						
Maintenance Personnel	50	1	94	74.374	.111	76.411
Operating Personnel	4	---	---	1.240	---	---
Health Physics Personnel	12	---	---	6.066	---	---
Supervisory Personnel	5	2	1	1.530	.904	.286
Engineering Personnel	10	11	3	4.583	1.985	.176
SPECIAL MAINTENANCE						
Maintenance Personnel	4	---	210	.909	---	243.360
Operating Personnel	1	---	---	.444	---	---
Health Physics Personnel	4	---	---	1.429	---	---
Supervisory Personnel	---	4	7	---	1.111	2.600
Engineering Personnel	1	15	11	.676	4.957	6.758
WASTE PROCESSING						
Maintenance Personnel	3	---	---	.087	---	---
Operating Personnel	20	---	---	4.067	---	---
Health Physics Personnel	13	---	---	2.030	---	---
Supervisory Personnel	---	---	---	---	---	---
Engineering Personnel	---	---	---	---	---	---
REFUELING						
Maintenance Personnel	---	---	---	---	---	---
Operating Personnel	18	---	---	1.085	---	---
Health Physics Personnel	5	---	---	.129	---	---
Supervisory Personnel	2	---	---	.095	---	---
Engineering Personnel	2	---	---	.554	---	---
INSERVICE INSPECTION						
Maintenance Personnel	---	---	14	---	---	5.706
Operating Personnel	---	---	---	---	---	---
Health Physics Personnel	---	---	---	---	---	---
Supervisory Personnel	1	---	1	.144	---	.711
Engineering Personnel	---	---	---	---	---	---
TOTALS						
Maintenance Personnel	50	1	293	76.317	.111	325.482
Operating Personnel	47	---	---	36.777	---	---
Health Physics Personnel	14	---	---	19.248	---	---
Supervisory Personnel	11	4	10	6.702	2.037	3.803
Engineering Personnel	17	19	15	19.946	8.035	7.284
GRAND TOTALS	139	24	318	158.990	10.183	336.569