

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket No: 50-305
License No: DPR-43

Report No: 50-305/99010(DRP)

Licensee: Wisconsin Public Service Corporation

Facility: Kewaunee Nuclear Power Plant

Location: N 490 Highway 42
Kewaunee, WI 54216

Dates: September 11 through October 19, 1999

Inspectors: J. Lara, Senior Resident Inspector
Z. Dunham, Resident Inspector

Approved By: Melvyn N. Leach, Chief
Reactor Projects Branch 2
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EXECUTIVE SUMMARY

Kewaunee Nuclear Power Plant NRC Inspection Report 50-305/99010(DRP)

This report includes results of the routine, unannounced inspection by resident inspectors of plant operations, maintenance, engineering, and plant support.

Operations

- The licensee reduced power on September 18, 1999, to perform main turbine stop and control valve testing. The Shift Supervisor conducted a pre-task briefing and discussed personnel roles and responsibilities, contingency actions, and lessons learned. The performance of the power reduction was conducted in a controlled manner. Operations personnel response to a turbine stop valve failure to open was appropriate. Senior reactor operators provided appropriate oversight of reactivity changes. (Section O1.2)
- The licensee appropriately declared the seismic monitor out-of-service after identifying that although seismic events could be detected, the alarm function was unreliable. Additionally, the system calibration procedure was inadequate in that it did not ensure Technical Specification operability requirements were met. The licensee implemented appropriate compensatory actions. A Non-Cited Violation was identified. (Section O1.3)

Maintenance

- The licensee performed work in accordance with the prescribed work instructions. In addition, the technicians were knowledgeable of their assigned tasks and work document requirements. (Section M1.1)
- The licensee adequately evaluated the potential for premature lifting or weepage of an Internal Containment Spray relief valve. The inspectors did not identify any deficiencies with the licensee's operability determination. However, the setpoint for the Internal Containment Spray relief valve did not account for back-pressure from the relief path. An Unresolved Item was initiated to allow further review of this issue. (Section M2.1)
- The licensee identified that a quarterly surveillance procedure was technically inadequate in that it required operation of specific containment isolation valves while at power. The inspectors reviewed the licensee's corrective actions and identified no deficiencies. Operation of these valves resulted in a violation of Technical Specification Section 3.6.a which provided requirements for maintaining containment integrity while at power. A Non-Cited Violation was identified. (Section M2.2)

Engineering

- Good engineering support to plant operations and maintenance organizations was observed during the course of plant work activities. This was evident through inspectors' reviews of various design and degraded equipment issues such as the seismic monitoring system. In general, the engineering safety evaluations and technical support to other departments were technically sound. However, there was one example

identified where a relief valve setpoint did not account for back-pressure from the relief path. (Section E1.1)

Plant Support

- Work activities associated with the High Integrity Container radwaste shipment were performed in accordance with the procedure requirements and the radiation work permit. No deficiencies were identified. (Section R1.2)
- The inspectors identified a failure to control a safeguards drawing. The licensee took prompt actions to control the information. A Non-Cited Violation was identified. (Section S1.1)

Report Details

Summary of Plant Status

The unit operated at power levels up to approximately 97 percent power during the 6-week inspection report period. On September 18, 1999, operators briefly reduced power to perform turbine stop valve and control valve testing.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

The inspectors conducted frequent reviews of ongoing plant operations. These reviews included observations of control room evolutions, shift turnovers, and log keeping. The inspectors also reviewed the Updated Safety Analysis Report (USAR) Section 12, "Conduct of Operations," the facility's Technical Specifications (TS), and operability evaluations completed by the licensee.

The inspectors reviewed the documents and procedures located at the dedicated shutdown panel. In general, the procedures and documents reviewed were current and updated with the most recent revision. However, the inspectors identified an operator aid, used for cool-down and de-pressurization of the reactor coolant system, which had not been updated to reflect the most recent revision. The revision occurred in April 1999. The licensee subsequently identified that the operator aid was not authorized for use at the shutdown panel. The inspectors noted that use of the previous revision, which was more restrictive, would not have resulted in a violation of operating limits. The licensee subsequently removed the unauthorized operator aid from the shutdown panel.

The inspectors observed shift turnover meetings and observed discussions regarding the status of plant equipment, planned testing, and maintenance. Operators exhibited good working knowledge of plant equipment and instruments. Specific events and observations are detailed in the sections below.

O1.2 Scheduled Load Reduction

a. Inspection Scope (71707)

The inspectors observed control room activities during the scheduled load reduction to allow for main turbine stop and governor valve testing. The following procedures were reviewed:

- Operations Procedure N-0-03, "Plant Operation Greater Than 15 percent Power," Revision A1

- Operations Procedure N-TB-54, "Turbine and Generator Operation," Revision AM
- Surveillance Procedure (SP) SP 54-086, "Turbine Stop and Governor Valve Operability Test," Revision AB

b. Observations and Findings

On September 18, 1999, the licensee performed a planned unit load reduction to 70 percent power. The inspectors attended the pre-task briefing for the down-power and the performance of Procedure SP 54-086 and observed that the briefing clearly defined roles and responsibilities for the operators involved with the evolutions. The Shift Supervisor (SS) re-enforced operational guidelines for alarm response and reactivity control. Additionally, the SS discussed contingency actions to take if an unexpected plant response occurred. Operations personnel had prepared in advance a set of procedures which outlined the load reduction and subsequent increase to normal full power. The inspectors determined the procedures to be appropriate for the planned evolutions.

The inspectors noted that the pre-task briefing was improved over the pre-task briefing held for the previous down-power which occurred on June 19, 1999. The pre-task briefing also included lessons learned and incorporated corrective actions as a result of the transient which occurred during the previous performance of Procedure SP 54-086. Additionally, Procedure SP 54-086 was recently revised, as another corrective action, to provide additional operator guidance.

During the conduct of the power reduction, the inspectors observed that all reactivity changes were first communicated to the supervising Senior Reactor Operator and acknowledged prior to proceeding. The reactor operators performed reactivity management calculations the previous evening in preparation for the load reduction. Reactivity changes were well controlled and performed in small increments.

The inspectors observed operations personnel response to a turbine stop valve (Valve SV-2) failure to open during the performance of Procedure SP 54-086. Operations personnel determined that one of the associated control valves was slightly open which created a differential pressure across Valve SV-2 and prevented it from opening. The SS conducted a briefing to discuss a partial procedure to fully close the control valve to allow Valve SV-2 to open. The control valve was subsequently fully closed and Valve SV-2 opened. The inspectors did not identify any deficiencies during the down-power or testing activities.

c. Conclusions

The licensee reduced power on September 18, 1999, to perform main turbine stop and control valve testing. The SS conducted a pre-task briefing and discussed personnel roles and responsibilities, contingency actions, and lessons learned. The performance of the power reduction was conducted in a controlled manner. Operations personnel response to a turbine stop valve failure to open was appropriate. Senior reactor operators provided appropriate oversight of reactivity changes.

O1.3 Seismic Monitoring System Out-of-Service

a. Inspection Scope (71707)

The inspectors reviewed the licensee's actions in response to the licensee's identification of an inadequate calibration of the seismic monitor and the subsequent determination that the seismic monitor was out-of-service. The inspectors reviewed the following documents:

- SP 87-133, "Seismic Monitoring System Calibration and Functional Test," Revision D
- Kewaunee Assessment Process (KAP) 3360
- KAP 3361
- USAR Appendix A, A.1-14, "Seismic Design Criteria"
- Emergency Plan Implementing Procedure, EP-AD-2, Table AD 2.1, Chart M, "Earthquake"

b. Observations and Findings

During the performance of Procedure SP 87-133 on September 16, 1999, the technician performing the SP suspected that there were component installation deficiencies which would not allow the seismic monitor to properly trigger alarms. The licensee's subsequent review revealed that the seismic monitor components were installed correctly; however, the licensee determined that there were noisy power supplies and another faulty component which could prevent the seismic monitor from alarming properly. The licensee documented this deficiency in KAP 3360. The licensee's prompt operability determination was that the seismic monitor was operable due to the ability to still detect seismic events. The licensee subsequently placed the seismic monitor out-of-service due to the alarm function's unreliability.

Emergency Plan Implementing Procedure EP-AD-2 prescribed the criteria for emergency classification in the event of a seismic event. The procedure relied upon alarm or individual detection of a seismic event for the determination of the emergency declaration classification. Due to the unreliability of the seismic monitor's alarms, the licensee implemented compensatory measures. These included a temporary change to Procedure EP-AD-2 which required, in part, that in the event of a seismic event, the Point Beach Nuclear Plant (located approximately 5 miles away) was to be contacted to determine the magnitude of the seismic event. The seismic monitor was subsequently repaired and returned to service.

Technical Specification Table 4.1-1 required that the seismic monitor be calibrated each refueling cycle. The licensee concluded that Procedure SP 87-133 was inadequate in that it failed to ensure system operability. The inadequacy of Procedure SP 87-133 to ensure system operability resulted in a violation of TS operability requirements. This Severity Level IV violation is being treated as a Non-Cited Violation (NCV), consistent with Appendix C of the NRC Enforcement Policy (NCV 50-305/99010-01, Inadequate Surveillance Procedure Regarding Seismic Monitoring System). This violation is in the licensee's corrective action program as KAP 3361. Additionally, the licensee plans to submit a licensee event report on this matter.

c. Conclusions

The licensee appropriately declared the seismic monitor out-of-service after identifying that although seismic events could be detected, the alarm function was unreliable. Additionally, the system calibration procedure was inadequate in that it did not ensure TS operability requirements were met. The licensee implemented appropriate compensatory actions. An NCV was identified.

O2 Operational Status of Facilities and Equipment

O2.1 Plant Equipment and System Walkdowns (71707)

In addition to routine plant inspections, the inspectors evaluated selected portions of the auxiliary feedwater system. The auxiliary feedwater system was one of the top ten most important systems based on the licensee's probabilistic risk assessment. The inspectors did not identify any operability concerns during the system review. Additionally, the inspectors toured the containment and noted that the containment material condition was good.

II. Maintenance

M1 Conduct of Maintenance

M1.1 Maintenance and Surveillance Test Observations (61726 and 62707)

The inspectors observed and reviewed all or portions of the following surveillance test and maintenance activities:

- Work Request 214424, Test Auxiliary Feedwater Motor Operated Valve SW-601A
- SP 34-099, "RHR Pump and Valve Test - IST," Revision AM
- SP 54-233, "Turbine Redundant Overspeed Trip Test," Revision K
- SP 38-101B, "Station Battery BRB-101 Monthly and/or Quarterly Test," Revision E
- Preventive Maintenance Procedure 23-02, "Containment Spray (ICS) QA-1Motor Operated Valve Maintenance," Revision K
- SP 49-075, "Control Rod Exercise," Revision V

The inspectors also reviewed the SP and the appropriate USAR sections.

The licensee performed work in accordance with the prescribed work instructions. In addition, the technicians were knowledgeable of their assigned tasks and work document requirements.

M2 Maintenance and Material Condition of Facilities and Equipment

M2.1 Internal Containment Spray (ICS) Relief Valve

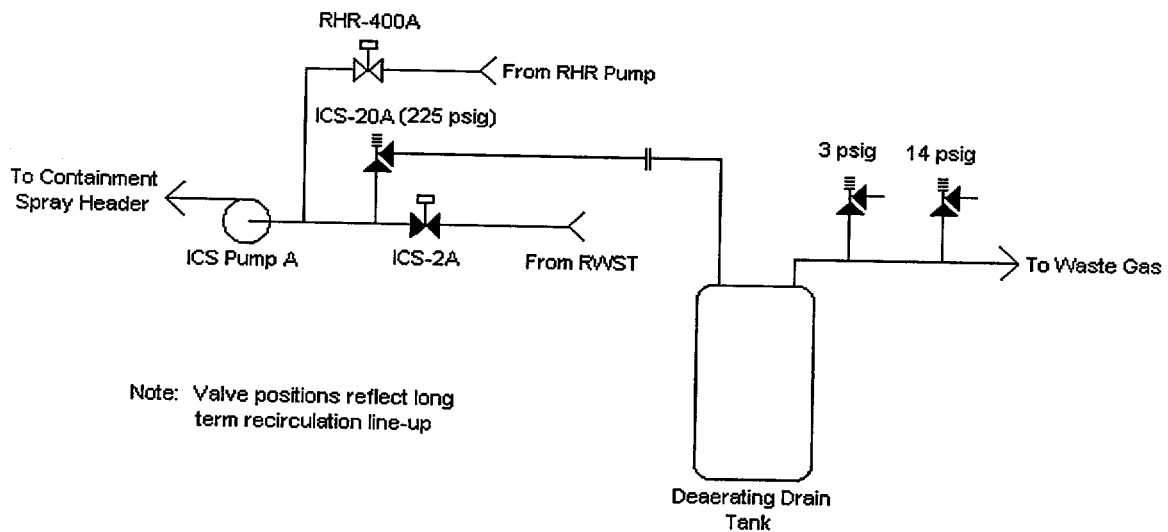
a. Inspection Scope (61726 and 37551)

During observations of routine surveillance test activities, the inspectors noted that a coupling on the ICS relief valve (Valve ICS-20A) discharge piping contained boric acid residue. The inspectors reviewed the following documents:

- SP 34-099, "RHR Pump and Valve Test - IST," Revision AM
- Work Request 213980
- Auxiliary Operator Logs for September 21, 1999
- KAP 3480
- KAP 0415
- USAR, Section 6.4, "Containment Vessel Internal Spray System"
- Boric Acid Leak Tracking Log

b. Observations and Findings

During the observations of the SP, the inspectors noted that the boric acid residue on a coupling downstream of the relief path for relief Valve ICS-20A could be indicative of premature valve lifting or weepage past the valve. This was discussed with licensee personnel for evaluation. Operation personnel had also previously identified the boric acid residue as a recurring condition and were tracking this condition in the Boric Acid Leak Tracking Log. The relief valve was located on the suction piping of ICS Pump A, as shown on the simplified system drawing below:



Simplified Drawing

Additionally, the inspectors questioned licensee personnel regarding the relief valve setpoint. During normal plant operations, the system pressure at the relief valve is the nominal Refueling Water Storage Tank pressure of 25-30 pounds per square inch gage (psig). During the performance of Procedure SP 34-099, the pressure at the relief valve is approximately 180 psig due to the residual heat removal pump providing the supply to the ICS pump, as in the long-term recirculation mode of operation. The relief valve discharge was routed to the deaerating drain tank, which could be potentially pressurized up to 14 psig. The inspectors questioned the licensee as to whether the drain tank back-pressure had been accounted for in the setpoint determination for the relief valves in each ICS train (Valves ICS-20A/B). This was of concern since the relief valve setpoint was set at 225 psig and the ICS pump suction piping design pressure was also 225 psig, as discussed in USAR Section 6.4.2.

The licensee initiated KAP 3480 to document the inspectors concerns. The licensee's prompt operability determination in KAP 3480 was that Valve ICS-20A was operable based on satisfactory leak tests which had been previously performed. Additionally, premature lifting of the relief valve was unlikely based on insignificant changes in drain tank levels logged prior to and following the performance of Procedure SP 34-099. However, the licensee acknowledged that weepage past the valve could occur and that continued evaluation was necessary. The inspectors did not identify any deficiencies with the licensee's operability determination. With respect to the relief valve setpoint, the licensee determined that the drain tank back-pressure had not been accounted for in the determination of the relief setpoint of Valve ICS-20A, but that pipe stress limits would not be exceeded if the relief valve lifted at a higher pressure than 225 psig.

The above issue will be documented as an Unresolved Item (URI) pending further NRC review of the licensee's evaluations of whether the failure to include the back-pressure in the setpoint determination of Valves ICS-20A/B constituted a violation of the licensee's In-Service Test plan (URI 50-305/99010-02, Effect of Back-pressure in the Determination of ICS Relief Valve Setpoint).

c. Conclusions

The licensee adequately evaluated the potential for premature lifting or weepage of an ICS relief valve. The inspectors did not identify any deficiencies with the licensee's operability determination. However, the setpoint for the ICS relief valve did not account for back-pressure from the relief path. An URI was initiated to allow further review of this issue.

M2.2 Surveillance Testing of Containment Isolation Valves

a. Inspection Scope (61726)

The inspectors reviewed the licensee's actions taken in response to identifying that operation of containment isolation valves violated containment integrity requirements prescribed in the facility's TS. The inspectors reviewed the following documents:

- KAP 3523
- Night Order on Restrictions on Opening Post Loss-of-Coolant Accident (LOCA) Hydrogen Valves, October 7, 1999
- SP 55-167-4, "Post LOCA Valves Timing Test (IST)," Revision R
- Environmental Qualification Maintenance/Surveillance Review Forms
- TS 1.0.g, Containment System Integrity Definition
- TS 3.6.a, Containment System Integrity Requirements
- USAR Section 5.3, Reactor Containment Vessel Isolation Systems

b. Observations and Findings

On October 6, 1999, the licensee identified that operation of certain containment isolation valves during surveillance testing violated containment integrity requirements. Specifically, TS Section 1.0.g defined containment integrity in part by having non-automatic containment isolation valves and blind flanges closed as required. Additionally, TS Section 3.6.a required, in part, that containment integrity be maintained when at power. However, the licensee periodically operated 12 non-automatic containment isolation valves during surveillance testing while containment integrity was required. The affected valves were:

SA-7003A/B	LOCA-2A/B	LOCA-3A/B
LOCA-10A/B	LOCA-100A/B	LOCA-201A/B

The above valves were operated on a quarterly basis in accordance with Procedure SP 55-167-4 to maintain the valves' environmental qualification and were required to be operable for post LOCA operations. Upon identification of this condition, the licensee identified the applicable SP as technically inadequate in that it required operation of the subject valves while at power. The inspectors reviewed the licensee's corrective actions and identified no deficiencies.

The failure to meet containment integrity requirements was determined to be a violation of TS Section 3.6.a. This Severity Level IV violation is being treated as an NCV consistent with Appendix C of the NRC Enforcement Policy (NCV 50-305/99010-03, Operation of Containment Isolation Valves Contrary to Technical Specifications). This violation is in the licensee's corrective action program as KAP 3523. Additionally, the licensee plans to submit a licensee event report on this matter.

c. Conclusions

The licensee identified that a quarterly surveillance procedure was technically inadequate in that it required operation of specific containment isolation valves while at power. The inspectors reviewed the licensee's corrective actions and identified no deficiencies. Operation of these valves resulted in a violation of TS Section 3.6.a which provided requirements for maintaining containment integrity while at power. An NCV was identified.

III. Engineering

E1 Conduct of Engineering

E1.1 General Comments (37551)

Good engineering support to plant operations and maintenance organizations was observed during the course of plant work activities. This was evident through inspectors' reviews of KAPs and various design and degraded equipment issues such as the seismic monitoring system (see Section O1.3). In general, the engineering safety evaluations and technical support to other departments were technically sound. However, there was one example identified where a relief valve setpoint did not account for back-pressure from the relief path (See Section M2.1).

IV. Plant Support

R1 Radiological Protection and Chemistry Controls

R.1.1 General Comments (71750)

The inspectors performed frequent walkdowns of safety-related equipment located within the radiologically controlled area. The inspectors noted that radiation and high radiation areas were posted and controlled in accordance with NRC requirements. Contaminated areas were kept to a minimum thus allowing for operator access to equipment without the need for protective clothing.

The inspectors observed radiation protection personnel activities during a routine containment tour. The inspectors noted that the radiation protection technician was thorough in the radiation surveys taken and knowledgeable of various radiation levels within the containment. No deficiencies were identified during the tour.

R1.2 Shipment of Radwaste

a. Inspection Scope (71750)

The inspectors observed the activities for the loading of the high integrity container (HIC) which contained radwaste in preparation for shipping. Health Physics (HP) Procedure HP-9.17, "14-190H Cask Shipping Procedure," Revision B, and the associated radiation work permit were reviewed during this inspection.

b. Observations and Findings

The inspectors observed HP personnel perform surveys for contamination and dose rates in preparation for and during the loading of the HIC. Precautionary measures were taken to keep personnel away during the HIC movement to reduce exposure. Continuous monitoring was provided by HP personnel. Additionally, the control room was notified of pending radiation alarms due to the HIC movements. The inspectors

determined that the work activities were performed in accordance with the procedure requirements and the radiation work permit. No deficiencies were identified by the inspectors.

c. Conclusions

The inspectors determined that the work activities associated with the HIC radwaste shipment were performed in accordance with the procedure requirements and the radiation work permit. No deficiencies were identified by the inspectors.

S1 Conduct of Security and Safeguards Activities

S1.1 Control of Safeguards Drawings

a. Inspection Scope (71750)

The inspectors reviewed the licensee's response and the circumstances involving the lack of control of a safeguards drawing. Nuclear Administrative Directive (NAD) 15.3, "Control of Safeguards Information," Original Revision, was reviewed.

b. Observations and Findings

On October 12, 1999, the inspectors observed that an electrical wiring drawing which was stamped as "Safeguards" was not properly controlled to prevent unauthorized use. The drawing was located in the electrical workshop area. This condition was brought to the attention of licensee personnel who subsequently took positive control of the drawing. No other examples were identified and the licensee appropriately tracked this issue as a loggable security event. Nuclear Administrative Directive 15.3 required, in part, that safeguards information shall be under the control of an authorized individual or stored in an approved security storage container to limit access.

Technical Specification 6.8.a requires, in part, that written procedures and administrative policies shall be established and implemented that meet the requirements and recommendations of Section 5.3 of ANSI N18.7-1976. Section 5.3 of ANSI N18.7-1976 states, in part, that activities affecting safety at nuclear power plants shall be described by written procedures and shall be accomplished in accordance with these procedures. The failure to control the safeguards drawing in accordance with NAD 15.3 was considered a violation of TS 6.8.a. This Severity Level IV violation is being treated as an NCV consistent with Appendix C of the NRC Enforcement Policy (NCV 50-305/99010-04, Failure to Control Safeguards Information). This violation has been entered into the licensee's corrective action program (Reference No. S99-080).

c. Conclusions

The inspectors identified a failure to control a safeguards drawing. The licensee took prompt actions to control the information. An NCV was identified.

V. Management Meetings

X1 Exit Meeting Summary

On October 19, 1999, the inspectors presented the inspection results to the plant manager and members of his staff. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Wisconsin Public Service Corporation

D. Braun, Assistant Plant Manager - Operations
D. Cole, Acting Manager, Engineering and Technical Support
K. Evers, Manager, Nuclear Support Services
J. Hannon, Superintendent, Plant Instrument and Control
G. Harrington, Plant Licensing Supervisor
M. Marchi, Vice President - Nuclear
J. Mortonson, Assistant Plant Manager - Maintenance
M. Reinhart, Superintendent, Radiation Protection
C. Smoker, Superintendent, Plant Quality Programs
J. Stoeger, Superintendent, Operations
T. Webb, Nuclear Licensing Director
K. Weinbauer, Plant Manager

INSPECTION PROCEDURES USED

IP 37551: Onsite Engineering
IP 61726: Surveillance Observations
IP 62707: Maintenance Observation
IP 71707: Plant Operations
IP 71750: Plant Support Activities

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-305/99010-01	NCV	Inadequate surveillance procedure regarding seismic monitoring system
50-305/99010-02	URI	Effect of back-pressure in the determination of ICS relief valve setpoint
50-305/99010-03	NCV	Operation of containment isolation valves contrary to TS
50-305/99010-04	NCV	Failure to control safeguards information

Closed

50-305/99010-01	NCV	Inadequate surveillance procedure regarding seismic monitoring system
50-305/99010-03	NCV	Operation of containment isolation valves contrary to TS
50-305/99010-04	NCV	Failure to control safeguards information

Discussed

None

LIST OF ACRONYMS USED

ANSI	American National Standards Institute
CFR	Code of Federal Regulations
DRP	Division of Reactor Projects, Region III
HIC	High Integrity Container
HP	Health Physics
ICS	Internal Containment Spray
IST	In-Service Test
KAP	Kewaunee Assessment Process
LOCA	Loss-of-Coolant Accident
NAD	Nuclear Administrative Directives
NCV	Non-Cited Violation
NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
psig	Pounds per Square Inch Gauge
RHR	Residual Heat Removal
SP	Surveillance Procedure
SS	Shift Supervisor
SV	Stop Valve
TS	Technical Specifications
URI	Unresolved Item
USAR	Updated Safety Analysis Report