U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Docket Nos: 50-454, 50-455
License Nos: NPF-37, NPF-66

Report No: 50-454/96-07, 50-455/96-07

Licensee: ComEd Company

Facility: Byron Generating Station, Units 1 & 2

Location: Opus West III
1400 Opus Place
Downers Grove, IL 60515

Dates: August 21 - September 26, 1996

Inspectors: S. D. Burgess, Senior Resident Inspector
N. D. Hilton, Resident Inspector
C. K. Thompson, Illinois Department of Nuclear Safety

Approved by: Lewis F. Miller, Jr., Chief,
Division of Reactor Projects

EXECUTIVE SUMMARY
Byron Generating Station, Units 1 & 2
NRC Inspection Report 50-454/96-007, 50-455/96-007

This inspection included aspects of licensee operations, engineering, maintenance, and plant support. The report covers a six week period of resident inspection.

Operations

- In general, the conduct of operations was professional and safety-conscious. The addition of a separate control room briefing for maintenance, radiation protection, chemistry, and the extra operating shift effectively eliminated personnel and outage activity distractions from the main control room shift briefing (Section O1.1).

- Operators responded promptly and effectively to a turbine trip and the equipment failures subsequent to a resulting reactor trip (Section O1.2).

- The inspectors identified a violation regarding inadequate procedures that resulted in running the 2A chemical and volume control pump without essential service water to the pump's lube oil cooler (Section O1.5).

- The inspectors identified poor housekeeping in the 2A and 2B diesel oil storage tank rooms that resulted from fire protection system testing on July 22, 1996 (Section O2.1).

Maintenance

- Maintenance and surveillance activities were completed thoroughly and professionally with maintenance supervisors and system engineers monitoring activities (Sections M1.1 and M1.2).

Engineering

- Engineering department personnel provided sound and thorough safety evaluations regarding the Unit 2 steam generator (SG) A and SG C loose part retrieval plan and the evaluation of all four Unit 2 SG tube inspections (Section E2.1).

Plant Support

- The inspectors noted good radiological controls and ALARA briefings in the Unit 2 refueling outage. Sound radiological protection controls and careful radiological work practices were also noted during the performance of surveillances and maintenance activities (Section R1).

- The identification and confiscation of a .38 weapon and ammunition indicated the licensee's search techniques were effective (Section S1.1)

REPORT DETAILS

Summary of Plant Status

Unit 1 operated at power levels up to 97 percent until September 11, 1996, when a reactor trip occurred as a result of a turbine trip. The unit was returned to service at 6:48 a.m. on September 12, 1996. The unit has since operated at power levels up to 97 percent.

Unit 2 was in a refueling outage (B2R06) during this entire inspection period.

I. Operations

O1 Conduct of Operations

O1.1 General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious. Early in the outage, the licensee implemented a new control room briefing format where personnel from the extra operating shift, radiation protection, chemistry, and maintenance were briefed separately in the shift engineer's office. The main control room briefing only included the on-duty operators for both units. The inspectors noted that the new briefing format significantly reduced the number of personnel in the main control room and distractions from outage activities. Specific events and noteworthy observations are detailed in the sections below.

O1.2 Unit 1 Reactor Trip as a Result of a Turbine Trip

a. Inspection Scope (93702)

On September 11, 1996, at 12:17 a.m. (CDT), a Unit 1 reactor trip occurred due to a turbine trip. While performing a monthly turbine trip surveillance, a non-licensed operator inadvertently placed an operating tool on the manual turbine trip lever instead of the turbine trip bypass lever as required. The operator realized the error; however, in attempting to remove the operating tool, the operator caused a manual turbine trip.

b. Observations and Findings

All safety related equipment automatically actuated as designed. Channel A of the digital rod position indication (DRPI) failed during the trip; however, channel B indicated all rods were fully inserted. Other non-safety equipment failures during the transient included nine failed open feedwater (FW) heater relief valves, and the starting of the startup FW pump due to a breaker failure.

DRPI troubleshooting showed that there was a reduced coil voltage for a single coil on the A train coil stack for two rods. The reduced voltage caused DRPI to spuriously misinterpret the location of the rod cluster control assembly for A train only. This in turn caused DRPI urgent failure and DRPI alarms. As interim corrective action, the licensee removed several cards in the A train, which disabled that train for the two rods. Train B still provided indication for the operators. Final problem resolution requires the plant to be shut down and the integrated head package partially disassembled. This repair will be completed during an outage of appropriate duration.

The feedwater heater relief valves, installed as thermal relief valves, experienced severe service and failed during the pressure increase accompanying main feedwater isolation following the turbine trip. The licensee's engineering department had been pursuing a potential modification to alleviate the lifting and damaging of the FW heater relief valves. The nine FW relief valves were replaced prior to unit startup. The startup FW pump breaker failure was due to the roller and cam mechanism failing to latch. The breaker was replaced. As corrective action for the turbine trip, the licensee placed a barrier over the hub of the turbine trip lever to physically prevent the operating tool from fitting on the lever.

O1.3 Unit 1 Startup Observations (71707)

The inspectors observed startup activities in the Unit 1 control room on September 12, 1996. The startup was characterized by clear operator communications, attentive reactor engineering oversight, and effective control by shift supervision. A shift turnover near the point of criticality was well-planned and controlled. The inspectors concluded that the overall startup was performed effectively.

O1.4 Both Source Range Monitors Out of Service

a. Inspection Scope (93702)

The inspectors reviewed the licensee's actions in identifying both Unit 2 source range monitors out of service (OOS).

b. Observations and Findings

On September 22, 1996, in Mode 5, the licensee identified that both source range (SR) detectors were OOS for approximately 18 minutes during surveillance testing. The SR detector N32 Level Trip Bypass switch and the High Flux At Shutdown alarm were blocked during the performance of surveillance 2BOS 3.1.1-21, "Train B Solid State Protection System Bi-Monthly Surveillance," due to excessive detector spiking. At the time, N32 was considered inoperable as it was de-energized to perform the surveillance test. When the test for B train was completed, N32 was left blocked due to continued excessive spiking and placed on the

degraded equipment list. N32 was considered operable, because the spiking did not preclude count rate trending, could input to the boron dilution prevention system, and the reactor trip breakers were open.

The licensee identified that a shift change occurred without an apparent turnover on the status of SR detector N32. The new shift performed surveillance 2BOS 3.1.1-20, "Train A Solid State Protection System Bi-Monthly Surveillance." During the train A surveillance, SR N31 was inoperable due to being de-energized, the reactor trip breakers were closed, and SR detector N32 High Flux Level trip was in bypass. The test lasted approximately 18 minutes, after which the reactor trip breakers were open and SR detector N31 was energized and returned to service.

Technical Specification (TS) 3/4.3.1, Table 3.3-1, identified two shutdown conditions for which requirements were given for SR detector operability: (1) the reactor trip breakers closed and the control rod drive system (CRDS) capable of rod withdrawal, or (2) the reactor trip breakers open. During the train A surveillance, the CRDS was disabled such that rod withdrawal was not possible and the reactor trip breakers were closed. Therefore, the plant was in a configuration where no TS action was required. However, TS interpretation 3/4.3.3.1-2, written by the licensee to cover this configuration, stated to default to the TS actions required in (1), and considered both SR monitors OOS. The licensee stated that the TS interpretation was inappropriate and that the TS was satisfied, in that, the plant was in a configuration not covered by TS. The issue regarding the authority of TS interpretations is considered an inspector follow-up item (50-455/96007-01(DRP)).

O1.5 Inadequate Cooling to Chemical and Volume Control Pump Lube Oil Cooler

a. Inspection Scope (71707)

The inspectors reviewed a test where the 2A chemical and volume control (CV) pump was run without essential service water cooling to the pump lube oil cooler for 27 minutes.

b. Observations and Findings

On September 14, 1996, the licensee identified that surveillance procedure 2BVS 1.2.3.1-1, "ASME Surveillance Requirements for Centrifugal Charging Pump 2A and Chemical and Volume Control System Valve Stroke Test," Revision 12, was performed with essential service water (SX) isolated to the CV pump lube oil cooler for 27 minutes. The discovery was made approximately five hours after the surveillance was completed.

The inspector identified that procedure 2BVS 1.2.3.1-1, failed to provide adequate steps to ensure that SX provided cooling to the 2A CV pump lube oil cooler. This is considered a violation of 10 CFR 50, Appendix B, Criterion V (50-455/96007-02(DRP)).

The licensee addressed the effects of having SX isolated to the 2A CV lube oil cooler for 27 minutes. The inspectors reviewed the point history for the 2A CV pump which revealed that the bearing temperatures were within the ASME surveillance requirements.

c. Conclusions on the Conduct of Operations

Operators responded promptly and effectively to the turbine trip and to the equipment failures subsequent to the reactor trip. The inspectors determined that the licensee's short and long term corrective action for equipment failures experienced after the reactor trip were appropriate.

The inspectors identified concerns with configuration controls during the conduct of surveillance tests. In one instance, the inspectors identified an inadequate procedure that resulted in the 2A CV pump being run without essential water to the lube oil cooler. In the other instance, the lack of a thorough shift turnover resulted in both SR monitors being OOS.

O2 Operational Status of Facilities and Equipment

O2.1 Engineered Safety Feature (ESF) System Walkdowns (71707)

The inspectors used Inspection Procedure 71707 to walk down accessible portions of the following ESF systems:

- Unit 2 Emergency Diesel Generators A & B

Equipment operability, material condition, and housekeeping were acceptable except in the diesel oil storage tank rooms. The inspectors noted that valve 2DO003D, the 2D diesel oil transfer pump discharge check valve, was not labelled. They also noted a large amount of dried fire suppression foam on several fire nozzles in the 2A and 2B diesel oil storage tank rooms, the floor, and some equipment. The fire protection system engineer stated to the inspectors that the foam was residue from a once-every-three-year surveillance of the foam spray headers and deluge nozzles. This test was conducted on July 22, 1996. The inspectors concluded that the two month delay in cleaning up the residue was an example of poor housekeeping. The licensee initiated corrective actions to label the valve and clean the rooms. The inspectors had no further concerns.

O8 Miscellaneous Operations Issues (92901)

O8.1 (Closed) Violation 50-454/455-95013-03: Inadequate procedures for the boric acid and diesel oil transfer systems. The inspectors reviewed the corrective actions as described in a letter from the licensee dated April 17, 1996. The actions appeared adequate. However, the inspectors noted that there were minor inconsistencies between procedures 2BVS 0.5-3.DO.1, "Unit 2 ASME Requirement for Test of the Diesel Oil Transfer System," Revision

M1.2 Surveillance Observations

a. Inspection Scope (61726)

The inspectors observed all or parts of the following surveillance and special test procedures:

• 1BVS 0.5-3.CC.1-1	Surveillance Requirements for Component Cooling (CC) Pump 1CC01PA
• 2BVS 8.2.1.2.E-2	125V Battery Bank 5-Year Capacity Test
• 2BVS 8.1.1.2.f-14	2B Diesel Generator Sequencer Test
• 1BVS 1.2.3.1-2	ASME Surveillance Requirements for Centrifugal Charging (CV) Pump 1B and Chemical Volume Control System Valve Stroke Test
• 1BVS 5.2.f.3-1	ASME Surveillance Requirements for Residual Heat Removal (RH) Pump 1RH01PA
• SPP 96-055	Dual Train Auxiliary Feedwater Suction Transient Hydraulic Test

b. Observations and Findings

During the observation of surveillances, the inspectors questioned the use of a dedicated non-licensed operator to reposition manual valves when systems/trains were not considered out of service during the test. The licensee stated that the use of dedicated operators was utilized for systems that do not receive an automatic actuation.

The inspectors reviewed Byron operating procedure BOP RH-5, "RH System Startup for Recirculation," Revision 9. The procedure noted that, in Mode 4, the normally locked-closed RH recirculation to reactor water storage tank isolation valve, RH8735, may be opened provided that a dedicated operator stationed nearby will close the valve in the event of a safeguards actuation to ensure adequate flow is available to all four cold legs. The inspectors were concerned that the dependance of the operator created two new failure mechanisms: (1) the failure of the operator to close the valve, and (2) the failure of the valve to close.

The inspectors discussed this issue with the NRC technical staff and determined that the use of the dedicated operator was not an unreviewed safety questions since the bases for TS 3/4.5.3, ECCS Subsystems - T_{avg} < 350°F, allowed one operable ECCS subsystem without single failure consideration in Mode 4 on the basis of the stable reactor reactivity condition and the limited core cooling requirements. The inspectors had no further concerns with the use of dedicated operators for performance of this procedure.

M1.5 Conclusions on Conduct of Maintenance and Surveillances

Maintenance and surveillance activities were completed thoroughly and professionally with maintenance supervisors and system engineers monitoring activities.

III. Engineering

E2 Engineering Support of Facilities and Equipment

E2.1 Unit 2 Steam Generator Tube Leak & Tube Repair Summary

a. Inspection Scope (37551)

The inspectors reviewed procedures and documents related to the Unit 2 steam generator (SG) A loose part retrieval and subsequent tube repairs. Also reviewed were the non-destructive examination results for all four Unit 2 SGs performed during B2R06 refueling outage.

b. Observations and Findings

On August 9, 1996, Byron Unit 2 was brought to cold shutdown due to a primary-to-secondary leak in SG A. Byron engineering developed a comprehensive plan to investigate the location, extent, and cause of the leak. The source of the leak was found to be in tube 16-110 located on the cold leg side of SG A approximately one inch above the tube sheet. During eddy current examination, the licensee determined that the tube was damaged by a piece of metallic debris approximately 1-1/2" x 1" x 1/32" in size and triangular in shape. The loose part was retrieved and sent offsite for analysis. The licensee plugged four tubes in SG A as corrective action. The licensee also retrieved a previously identified loose part in SG C. The SG C loose part was identified as "wedge-shaped" metallic debris and was also sent offsite for further analysis. The loose part was located in an area where the tubes were plugged in previous outages. The part had not moved; therefore, no further tube plugging was necessary.

A total of 30 SG tubes were plugged during the Unit 2 forced outage and the Unit 2 B2R06 refueling outage. All tubes were inspected from the hot leg tube end to the cold leg tube end using a bobbin eddy current inspection. Additional inspections included 25 percent top of tubesheet (hot leg) using the rotating pancake coil (RPC), 25 percent row 1 and row 2 U-Bend using Point Plus, and 25 percent preheater expansion region using RPC in SG A.

c. Conclusions

Engineering personnel made sound and thorough safety evaluations regarding the Unit 2 SG A and SG C loose part retrieval plan and evaluation and the evaluation of all four Unit 2 SG tube inspections.

E8 Miscellaneous Engineering Issues (92902)

E8.1 (Closed) LER 50-455/96-003: Missed TS surveillance regarding SG tube inspections. On September 4, 1996, the licensee identified that 26 tubes in SG D and 4 tubes in SG B were not inspected and analyzed in accordance with the original inspection plans for previous refueling outages B2R03 and B2R05. The tubes were not inspected because they were misencoded with the wrong tube number. The licensee performed a review

of previous and subsequent refuel outage tube inspections and determined that the 30 tubes contained no detectable degradation. The licensee's corrective actions were appropriate and the safety consequences were minor. This licensee identified and corrected violation is being treated as a non-cited violation, consistent with Section VII.B.1 of the NRC Enforcement Policy. This item is closed.

IV. Plant Support

R1 Radiological Protection and Chemistry (RP&C) Controls

The inspectors noted good radiological controls implemented in the Unit 2 refueling outage during frequent tours of the radiologically protected area and ALARA briefings. The inspectors also noted sound radiological protection controls and careful radiological work practices during the surveillances and maintenance observations.

R3 RP&C Procedures and Documentation

R3.1 Review of License Conditions

The inspectors reviewed the license conditions and the TS administrative controls section for discrepant conditions or practices. The inspectors identified minor discrepancies in section 6.12, "High Radiation Area" and section 6.14, "Offsite Dose Calculation Manual (ODCM)." Both sections had not been updated to reference the applicable sections of 10 CFR Part 20. Section 6.12 also defined the high radiation area dose equal to or less than 1000 mR/hr at 45 cm instead of 30 cm. 10 CFR Part 20.1008, "Implementation," states, in part, that the 10 CFR Part 20 requirements must be used in lieu of the requirements that are cited in the licensee's TS. The inspectors confirmed that the licensee was in full compliance with the more restrictive requirements of 10 CFR Part 20. The licensee was already aware of the discrepancies and had made the necessary changes to their proposed Improved Technical Specifications. The inspectors had no further concerns.

P1 Conduct of Emergency Protection Activities

P1.1 Yearly Emergency Preparedness Meeting

On September 19, 1996, the inspectors attended the annual emergency preparedness meeting. The meeting was attended by the licensee's station management, ComEd corporate management, and state and local officials. The meeting presented the 1997 EP plans for Byron Station. The inspectors noted no concerns.

S1 Conduct of Security and Safeguards Activities ('1750)

S1.1 Identification and Confiscation of a Weapon

On September 5, 1996, a contractor attempted to bring a .38 caliber revolver, a speed loader, and 62 rounds of ammunition into the protected

S1 **Conduct of Security and Safeguards Activities (71750)**

S1.1 Identification and Confiscation of a Weapon

On September 5, 1996, a contractor attempted to bring a .38 caliber revolver, a speed loader, and 62 rounds of ammunition into the protected area. The weapon and ammunition was identified during a lunchbox search after detecting a undefinable mass in the x-ray machine. Since the contractor did not have a permit for the weapon, the Ogle County authorities were notified.

The licensee's investigation determined that the contractor did not have a harmful intent in bringing the weapon into the protected area. The individual had placed the weapon in the lunchbox after showing it outside the owner controlled area the previous night and had forgotten to remove it prior to entering the facility.

Security implemented an aggressive program to improve search techniques as a result of recent SQV audit findings. The identification and confiscation of the weapon and ammunition indicated the program's effectiveness. The inspectors had no further concerns.

F8 **Miscellaneous Fire Protection Issues (92904)**

F8.1 (Closed) Violation 50-454/455/94020-01: Failure to follow fire protection procedure requiring tags be placed on fire doors that were impaired. In August 1994, the inspectors identified two fire doors that were apparently impaired because the door sills had been temporarily removed and two doors that were impaired by being blocked opened. None of the doors were tagged as required by procedure BAP 1100-3, "Fire Protection Systems, Fire Rated Assemblies, Radiation, Ventilation, and Flood Seal Impairments." The inspectors reviewed the licensee's corrective actions as discussed in letters dated October 31, 1994, and March 15, 1996.

The responses stated that the door sills were subsequently reinstalled, returning the doors to an unimpaired state. The responses also stated that the two blocked open fire doors were not considered impaired if personnel were nearby to close the doors in the event of a fire. However, the licensee acknowledged that BAP 1100-3 did not specifically exempt tagging of impaired fire doors if personnel were stationed nearby. As part of corrective actions, fire marshall office personnel were counselled on management expectations regarding procedure adherence. The fire marshall also stated that fire door impairment requirements would be emphasized in annual station training and that procedure BAP 1100-3 would be revised to clearly state the exemption.

08.2 (Closed) Violation 50-454/455/95009-04: Failure to follow fire protection procedure requiring tags be placed on fire doors that were impaired. On September 18, 1995, the inspectors identified

S1 Conduct of Security and Safeguards Activities (71750)

S1.1 Identification and Confiscation of a Weapon

On September 5, 1996, a contractor attempted to bring a .38 caliber revolver, a speed loader, and 62 rounds of ammunition into the protected area. The weapon and ammunition was identified during a lunchbox search after detecting a undefinable mass in the x-ray machine. Since the contractor did not have a permit for the weapon, the Ogle County authorities were notified.

The licensee's investigation determined that the contractor did not have a harmful intent in bringing the weapon into the protected area. The individual had placed the weapon in the lunchbox after showing it outside the owner controlled area the previous night and had forgotten to remove it prior to entering the facility.

Security implemented an aggressive program to improve search techniques as a result of recent SQV audit findings. The identification and confiscation of the weapon and ammunition indicated the program's effectiveness. The inspectors had no further concerns.

F8 Miscellaneous Fire Protection Issues (92904)

F8.1 (Closed) Violation 50-454/455/94020-01: Failure to follow fire protection procedure requiring tags be placed on fire doors that were impaired. In August 1994, the inspectors identified two fire doors that were apparently impaired because the door sills had been temporarily removed and two doors that were impaired by being blocked opened. None of the doors were tagged as required by procedure BAP 1100-3, "Fire Protection Systems, Fire Rated Assemblies, Radiation, Ventilation, and Flood Seal Impairments." The inspectors reviewed the licensee's corrective actions as discussed in letters dated October 31, 1994, and March 15, 1996.

The responses stated that the door sills were subsequently reinstalled, returning the doors to an unimpaired state. The responses also stated that the two blocked open fire doors were not considered impaired if personnel were nearby to close the doors in the event of a fire. However, the licensee acknowledged that BAP 1100-3 did not specifically exempt tagging of impaired fire doors if personnel were stationed nearby. As part of corrective actions, fire marshall office personnel were counselled on management expectations regarding procedure adherence. The fire marshall also stated that fire door impairment requirements would be emphasized in annual station training and that procedure BAP 1100-3 would be revised to clearly state the exemption.

O8.2 (Closed) Violation 50-454/455/95009-04: Failure to follow fire protection procedure requiring tags be placed on fire doors that were impaired. On September 18, 1995, the inspectors identified two untagged fire doors that were blocked open during flushing of some floor drains. As discussed above, the violation occurred because of an inappropriate interpretation of procedure BAP 1100-3.

The inspector concluded that the fire door problems in 1994 and 1995 were isolated events and that adequate corrective actions had been taken. During the current inspection, the inspectors observed that impaired fire doors were tagged as required.

V. Management Meetings

X1 Exit Meeting Summary

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on September 26, 1996.

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

Licensee

K. Graesser, Site Vice President
K. Kofron, Station Manager
D. Wozniak, Site Engineering Manager
T. Gierich, Operations Manager
P. Johnson, Technical Service Superintendent
E. Campbell, Maintenance Superintendent
M. Snow, Work Control Superintendent
D. Brindle, Regulatory Assurance Supervisor
K. Passmore, Station Support & Engineering Supervisor
P. Donavin, Site Engineering Mod Design Supervisor
T. Schuster, Site Quality Verification Director
R. Colglazier, NRC Coordinator
B. Gossman, Chemistry Supervisor
S. Gackstetter, Thermal Group Leader
R. Wegner, Shift Operations Supervisor
M. Rasmussen, Operations Engineer Unit 2
W. Kouba, Long Range Work Control Superintendent

INSPECTION PROCEDURES USED

IP 37551:	Onsite Engineering
IP 61726:	Surveillance Observations
IP 62703:	Maintenance Observations
IP 71707:	Plant Operations
IP 71750:	Plant Support Activities
IP 92901:	Followup - Plant Operations
IP 92902:	Followup - Engineering
IP 92903:	Followup - Maintenance
IP 92904:	Followup - Plant Support
IP 93702:	Prompt Onsite Response to Events at Operating Power Reactors

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

50-455/96007-01	IFU	Both Unit 2 source range monitors out of service.
50-455/96007-02	VIO	Inadequate procedure regarding SX cooling to the 2A CV pump lube oil cooler.

Closed

50-454/455/95013-03	VIO	Inadequate procedures for the boric acid and diesel oil transfer systems.
50-454/455-94010-01	IFI	Weakness in the emergency operating procedure verification and validation process.
50-454/96-017	LER	Unit 1 trip due to personnel error during surveillance activities.
50-455/96-003	LER	Missed TS surveillance regarding SG tube inspections.
50-454/455/94020-01	VIO	Failure to follow fire protection procedures.
50-454/455/95009-04	VIO	Failure to follow fire protection procedures.

LIST OF ACRONYMS USED

ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
BOS	Byron Operating Procedure
BVS	Byron Surveillance Procedure
CC	Component Cooling Water System
CRDS	Control Rod Drive System
CV	Chemical and Volume Control System
DRPI	Digital Rod Position Indication
ECCS	Emergency Core Cooling Systems
EOP	Emergency Operating Procedure
ESF	Engineered Safety Feature
FW	Feedwater System
OOS	Out of Service
RH	Residual Heat Removal System
RPC	Rotating Pancake Coil
SG	Steam Generator
SR	Source Range
SX	Essential Service Water
TS	Technical Specification
V&V	Verification and Validation