Exelon Generation
4300 Winfield Road
Warrenville, IL 60555

www.exeloncorp.com

Exelon Nuclear

RS-03-202

October 23, 2003

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Dresden Nuclear Power Station, Units 2 and 3
Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Additional Information Regarding Request for License Amendment for Main Steam Line Low Pressure Isolation Setpoint

Reference: Letter from P. R. Simpson (Exelon Generation Company, LLC) to U. S. NRC, "Request for Amendment to Technical Specifications for Main Steam Line Low Pressure Isolation Function," dated March 28, 2003

In the referenced letter, Exelon Generation Company, LLC (EGC) requested a change to the allowable value for the Main Steam Line (MSL) Pressure – Low Function of the Primary Containment Isolation System (PCIS) Instrumentation at Dresden Nuclear Power Station (DNPS), Units 2 and 3, and Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2.

In electronic mail dated July 21, 2003, and in a teleconference between Mr. Larry Rossbach of the NRC and Mr. A. R. Haeger of EGC on July 29, 2003, the NRC requested that EGC provide additional information to support review of the referenced letter. The attachments to this letter provide the requested information.

EGC has reviewed the information supporting a finding of no significant hazards consideration that was previously submitted to the NRC in Attachment 1 of the referenced letter. The bases for concluding that the proposed TS changes do not involve a significant hazards consideration are not affected by the supplemental information provided in Attachments 1 and 2 of this submittal.

Should you have any questions concerning this letter, please contact Mr. Thomas G. Roddey at (630) 657-2811.

A001

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 23rd day of October 2003.

Respectfully,

Patrick R. Simpson
Manager, Licensing

Attachments:
1. Additional Information Regarding Request for Amendment to Technical Specifications for Main Steam Low Pressure Isolation Function
2. GE Service Information Letter (SIL) No. 130, "Main Steam Line Low Pressure Isolation Limit Change," dated March 31, 1975

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

**ATTACHMENT 1**
**Additional Information Regarding Request for Amendment to Technical Specifications for Main Steam Low Pressure Isolation Function**

Question 1
*GE report GENE-0000-0010-4202-01P, "Engineering Evaluation of Impact on Transient and Safety Analyses of Reducing the Low Pressure Isolation Setpoint Analytical Limit to 785 psig Dresden Units 2 & 3 and Quad Cities, Units 1 & 2," January 2003 submitted as part of the application is based on the extended power uprate (EPU) analyses. The Dresden and Quad Cities EPU analyses was a generic analyses for a fifth fictional plant, not a plant specific analyses for Dresden and Quad Cities.*

*Submit a bounding plant specific analyses to support the main steam line low pressure primary containment isolation system (PCIS) allowable value amendment request.*

Response
The bases for the evaluation are the current analyses of record, which are specific to Dresden Nuclear Power Station (DNPS), Units 2 and 3, Quad Cities Nuclear Power Station (QCNPS), Units 1 and 2, or alternately are bounding to both stations. In all cases, the evaluation applies to the current plant licensing basis, including extended power uprate (EPU), and to both the GE and the older non-GE fuel designs. The results of the analyses are representative of an equilibrium core. It is noted that the current operating cycles (i.e., DNPS Unit 2, Cycle 18, DNPS Unit 3, Cycle 18, and QCNPS Unit 2, Cycle 17) each has one reload of GE14 fuel type. Because of a mid-cycle refueling outage, QCNPS Unit 1, Cycle 18, has two reloads of GE14. Thus, DNPS Unit 2, Cycle 18, and DNPS Unit 3, Cycle 18, cores are both 39% GE14. QCNPS Unit 1, Cycle 18, is 73% GE14, and QCNPS Unit 2, Cycle 17, is 37% GE14. For the upcoming cycles, all four plants will increase their amount of GE14 fuel type and more closely approach an equilibrium core of GE14 fuel.

Question 2
*Submit a copy of GE Service Information Letter (SIL) No. 130, "Main Steam Line Low Pressure Isolation Limit Change," dated March 31, 1975.*

Response
SIL 130 is provided in Attachment B.

Question 3
*Section 3.3.6, "High Energy Line Break," of Attachments 4 and 5 of the application states that "Within this range of break sizes, the reduction in the low pressure isolation setpoint would delay the [MSIV] isolation, resulting in an increase in the mass and energy release." The radiological consequence resulting from the postulated steam line break accident is directly proportional to the amount of mass (steam) released to the environment.*

*Provide the amount of increase in the mass and energy released and its corresponding increase in the radiological consequence dose.*

Response
The radiological consequences are directly proportional to the mass release. Therefore, an estimation of the additional mass release for a small steamline break postulated to isolate on

low pressure is used to respond to this question. The Design Basis Accident (DBA) steamline break outside containment (2.5 $ft^2$) is isolated on high flow and results in a 30,000 pounds (lbs) mass release and a corresponding thyroid dose of 30 Rem. GE performed evaluations to determine the mass released in the Main Steam Tunnel (MST) prior to isolation on high MST temperature. Results show that for DNPS, steamline breaks larger than 0.16 $ft^2$ will also isolate on high flow (120%) at 5.5 seconds, the same as for the DBA, though the mass release will be comparatively smaller because of the reduced break size. Similarly, for QCNPS, steamline breaks larger than 0.32 $ft^2$ will also isolate on high flow (140%) at 5.5 seconds. Again, the mass release will be comparatively smaller because of the reduced break size. Therefore, break sizes smaller than 0.16 $ft^2$ for DNPS, and 0.32 $ft^2$ for QCNPS, will isolate on signals other than high flow (e.g., high MST temperature, low vessel water level, or low vessel pressure.)

A review of vessel water level and pressure response for smaller steamline breaks outside containment indicates that breaks smaller than approximately 0.05 $ft^2$ may cause sufficient depressurization to result in a low pressure isolation. Steamline breaks larger than 0.05 $ft^2$ will result in a turbine trip and reactor scram due to level swell following the break initiation, and will likely isolate on low water level when the level swell has subsided. A steamline break of 0.05 $ft^2$ is used to estimate the potential effect of the low pressure isolation setpoint change. This 0.05 $ft^2$ break results in an average flow rate of 100 lbs/sec, and isolates on low water level at approximately 215 seconds, with an associated total mass release of 21,500 lbs and an approximate dose impact of 21.5 Rem thyroid. For this analysis, a break smaller than 0.05 $ft^2$ is assumed to have a mass release rate of 90 lbs/sec. This break is used as a reference to analyze a delayed isolation, assuming an isolation results from a low pressure condition rather than low water level. Analysis shows that the depressurization rate just prior to isolation on low water level is approximately 1.5 psi/sec. Therefore, for a 40 psi decrease in the Main Steam Line Low Pressure Isolation Setpoint, the low pressure isolation is potentially delayed by approximately 27 seconds (40 psi ÷ 1.5 psi/sec.) The potential mass release increase associated with this delay is approximately 2,400 lbs (27 sec X 90 lbs/sec.) This is conservative because the combination of mass discharge rate and depressurization is worse for larger breaks compared to smaller breaks, and larger breaks will isolate on low water level before low pressure. The corresponding dose increase would be approximately 2.4 Rem thyroid. The calculated total dose is 23.9 Rem for this scenario, compared to 30 Rem for a large MSL break. The mass release increase of 2,400 lbs for the setpoint change is considered bounding and not significant when compared to the DBA steamline break outside containment that results in a release of 30,000 lbs mass.

**ATTACHMENT 2**
**GE Service Information Letter (SIL) No. 130, "Main Steam Line Low Pressure Isolation Limit Change," dated March 31, 1975**


March 31, 1975 SIL No. 130

# MAIN STEAM LINE LOW PRESSURE ISOLATION LIMIT CHANGE

This Service Information Letter (SIL) describes a proposed main steam line (MSL) low pressure isolation limit change and provides justifi- cation for the requiredRto plant Technical Specifications. The proposed change can improve.plant availability by avoiding some reactor isolations due to spurious pressure transients and should eliminate Technical Specification violations experienced at some GE/BWR plants.

## DISCUSSION

The Technical Specification limit on the MSL low pressure isolation at most operating GE/BWRs does not provide satisfactory margin between the limit trip point and normal operating pressure at the turbine inlet. The allowed instrument set point range and the limit trip point are not clearly separated. To avoid violation of the Technical Specification it is necessary to provide sufficient margin for instru- ment drift and normal variation in set points by adjusting the pressure switch to trip well above the specified limit.

Operating experience has shown that the limit trip point is usually set close to normal operating pressure. As a result, the noise level of the pressure switch hydraulic sensing lines, or small pressure transients in the main steam lines, may initiate reactor isolation and the resulting scram.

## RECOMMENDED ACTION

The attachment to this SIL provides reasons for using a lower MSL low pressure isolation setting and justification for aRto the Technical Specification. The proposed limit allows adequate margin for normal operating pressure and provides for instrument trip setting variation.

General Electric recommends implementation of the changes outlined in the attachment. These recommendations are part of the resolution of the instrument drift problem experienced at several GE/BWRs and have previously been implemented at some plants.

A Technical SpecificationRmust be approved by the NRC prior to changing any instrument trip point limit.

Specific concerns relative to this recommended change regarding the Feedwater or Pressure Control Systems should be referred to your local GE representative. He can arrange for consultation with the appropriate GE-NED component.

Prepared By: G. P. Chew

Approved By: D. G. Bridenbaugh, Manager Performance Evaluation and Improvment

Issued By: V. G. Grayhek, Manager Performance Analysis and Service Communications

SIL No. 130 Attachment

## CHANGE IN MAIN STEAM LINE LOW PRESSURE ISOLATION SETTINGS

REASON FOR CHANGES

The implications of changing the low pressure Main Steam Line isolation signal from 850 (or 880) psig (current minimum Technical Specification limit) have been evaluated and it has been determined that the limiting setting can be safely lowered to 825 psig. This will enable operators to lower the nominal instrument set point to 850 psig, providing a 25 psi margin to the safety limit (825 psig) and approximately 25 psi margin to operational limits (875 psig). These changes should prove adequate in avoiding abnormal occurrence reporting for trips below the nominal setting and should preclude spurious scrams and isolations on low pressure transients.

JUSTIFICATION FOR CHANGES

The low pressure isolation signal is provided to give protection against fast depressurization thereby limiting cooldown on the vessel and fuel duty. The 850 (or 88D) psig low pressure isolation was originally determined based on judgment and was chosen approximately 100 psi less than the turbine inlet pressure. The 100 psi number is not critical and a larger value would result in only small changes in the effects on saturation temperature and fuel duty (the difference in saturation temperature between 850 [or 880] psig and 750 [or 780] psig is approximately 15oF). Operating margins less than 100 psi could cause unwanted isolations after scram events. This can occur since pressure regulators with their built-in control time constants may not be able to limit the pressure drop via the control valves (or bypass valves) before the isolation setpoint is reached; or could cause scrams on low pressure transients.

Lowering of the Technical Specification limit to 825 psig will not invalidate the transient safety analysis previously reported in (insert applicable document) and will result in a negligible added requirement in terms of fuel duty and vessel cooldown. Therefore, lowering of the existing isolation setpoint as described above will not degrade the degree of protection offered by this safety system.

=END=

---



---



Product Reference: B21 Nuclear Boiler System

---