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Docket Number 50-346

License Number NPF-3

Serial Number 1704

August 25, 1989

United States Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Subject: Davis-Besse Conformance to Regulatory Guide 1.97, Revision 3 - Main Steam Safety Valve Position Indication (TAC Number 51084)

Gentlemen:

The Nuclear Regulatory Commission (NRC) was advised by letter dated December 31, 1987, that Toledo Edison (TE) planned to re-evaluate a previous commitment (reference Serial Number 1232, dated January 27, 1986) to install Main Steam Safety Valve (MSSV) position indicators. Toledo Edison advised the NRC by telephone on July 26, 1989 that TE's re-evaluation had concluded direct position indication for the MSSVs would provide no additional relevant information to the operator that could not be obtained by monitoring other parameters. Toledo Edison agreed to provide a letter by August, 1989, documenting the basis for the decision not to install MSSV position indicators.

The commitment to install MSSV position indicators evolved from the NRC's review of TE's Regulatory Guide 1.97 compliance report submitted on June 28, 1984 (Serial Number 1059). The NRC's interim safety evaluation report (SER) (Log Number 1838, dated October 16, 1985) identified several open items for which additional information was needed to allow completion of the NRC review. Two SER open items were related to Main Steam Safety Valve (MSSV) position indication. One open item (SER Section 3.3.17) addressed a Type D variable to monitor operation (Closed - Not Closed) of individual safety systems important to safety, "Safety/Relief Valve Positions or Main Steam Flow." The other (SER Section 3.3.30) addressed a Type E variable, "Vent From Steam Generator Safety Relief Valves or Atmospheric Dump Valves," to be monitored for use in determining the magnitude of the release of radioactive materials and continuously assessing such releases. Toledo Edison resolved these open items by committing to install direct position indicators on the MSSVs and Atmospheric Vent Valves (AVVs) and to use a method that utilized the position indicators to more accurately assess radioactive releases.

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Position indicators were installed on the AVVs during the fifth refueling outage. Based on the justification provided in the attachment, TE no longer plans to install MSSV position indicators.

If you have any questions concerning this matter, please contact Mr. R. W. Schrauder, Nuclear Licensing Manager, at (419) 249-2366.

Very truly yours,

EBS/dlm

Attachment

cc: P. M. Byron, DB-1 NRC Senior Resident Inspector
A. B. Davis, Regional Administrator, NRC Region III
T. V. Wambach, DB-1 NRC Senior Project Manager

Re-evaluation of the Need for MSSV Position Indication

Background

Toledo Edison's initial response (Serial Number 1059) stated that the position of Atmospheric Vent Valves (AVVs) and MSSVs was not monitored and that this was not required to mitigate the consequences of a design basis accident. TE advised that the sound emitted from the valves provided an audible indication to the operators when either the MSSVs or AVVs lift. Additionally, this response stated that the AVV position was indicated in the Control Room via indicating lights on the SFAS panel and the AVV Hand/Auto Station Indicators. The NRC's interim SER concluded TE had not provided acceptable instrumentation for this variable and recommended TE provide the recommended instrumentation. By letter (Serial Number 1232) dated January 27, 1986, TE stated it would comply with this recommendation and provide Category 2 position indication for the AVVs and MSSVs. Toledo Edison advised that the Detailed Control Room Design Review (DCRDR) had identified the AVV and MSSV position indication as inadequate information and that Toledo Edison would coordinate this modification with the display study established by the DCRDR. Toledo Edison, in response to an NRC request made by letter (Log Number 2447) dated November 25, 1987, confirmed by letter (Serial Number 1460) dated December 31, 1987, its intent to install AVV position indication and advised that TE was re-evaluating the need for MSSV position indication. Toledo Edison installed position indicators on the AVVs during the fifth refueling outage.

Use of MSSV Position Indication for Monitoring Operation (Type D Variable) - SER Section 3.3.17 Open Item

On June 30, 1988, TE's DCRDR Display Special Study Group concluded that MSSV position indication is not essential to the safe operation of the plant. This conclusion was based on the following considerations. Regulatory Guide 1.97 defines Type D variables as those variables that provide information to indicate the operation of individual systems and other systems important to safety. There is ample alternate safety-related instrumentation available to operators to determine that a non-isolable steam generator leak to atmosphere is occurring. This includes Steam Generator pressure and level, Reactor Coolant System temperature, and Pressurizer level instrumentation. This instrumentation allows the operators to accurately assess and respond to the symptoms caused by MSSV malfunctions. This is consistent with the philosophy of Babcock and Wilcox Owners Group (BWOG) Abnormal Transient Operating Guidelines (ATOG) which forms the basis of the Emergency Procedure that the operators implement following a reactor trip. Additionally, the sound of a MSSV passing steam is loud and distinctive in the Control Room and the MSSV discharges are easily visible from outside the plant. This, along with the available instrumentation, permits quick and simple identification of MSSV malfunctions. Identification of the symptoms will allow operators to take appropriate actions available to cope with the specific failures. Knowing which and how many MSSVs have malfunctioned does not change the actions of the operator.

Toledo Edison evaluated an additional operational concern associated with the consequences of a Steam Generator Tube Rupture (SGTR) concurrent with a failed open MSSV. Steam Generator Tube Ruptures are unique events which do not follow the typical symptoms of the ATOG. Consequently, they are addressed separately in the ATOG. The primary means of detecting a tube rupture would be a main steam line (MSL) radiation monitor alarm which would occur as Nitrogen-16 enters the secondary side of the steam generator from the Reactor Coolant System (RCS) or a high radiation alarm at the condenser air ejector exhaust. In this case, the operators are directed to shut down the plant in a controlled manner to avoid lifting the MSSVs. However, should the plant trip and a MSSV fail in the open position, the operators would be aware of this condition by Steam Generator pressure and level indications, Reactor Coolant System (RCS) temperature indications and Pressurizer level indications. In addition to these indications, visual and/or audible observations provide reliable information for determining MSSV position. The loud noise emanating from the stuck open MSSV and the steam discharge provide a clear indication of this condition. In any event, the operator response for a SGTR event with or without a stuck open MSSV would be the same; that is to depressurize the RCS as rapidly as possible and attempt to isolate the steam generator. Based on the above, Toledo Edison concludes that a knowledge of individual MSSV position is not of use to mitigate a SGTR event with or without a failed MSSV.

Use of MSSV Position Indication in Determining the Magnitude of the Release of Radioactive Material and Continuously Assessing Such Releases (Type E Variable) - SER Section 3.3.30 Open Item

Toledo Edison's initial response (Serial Number 1059) for the Type E variable was that TE's current method of release assessment conservatively quantifies noble gas/radioiodine releases from the AVVs, MSSVs and auxiliary feedwater steam turbine exhaust utilizing the MSL radiation monitors or the steam jet air ejector radiation monitor. Additionally, radiation monitoring team surveys performed on-site and off-site are used to determine actual radiation levels due to a release. Toledo Edison took the position that the conservative method used to estimate radioactive release met the intent of Regulatory Guide 1.97. The NRC's interim report concluded that the arrangement described by Toledo Edison was unacceptable for this variable. The NRC advised that TE should: 1) identify the range of the MSL monitors, 2) verify the range is adequate and the instrumentation is Category 2, 3) indicate how the duration of the release and mass of steam per unit time is determined, and 4) show that the results derived from this method are within acceptable tolerance from the actual release. Toledo Edison responded to this open item (SER Section 3.3.30) by letter dated September 26, 1986 (Serial Number 1266). This letter described how TE met the intent of Regulatory Guide 1.97 using existing instrumentation and by assuming that steam flow rate corresponds to the feedwater flow required to remove decay heat. Toledo Edison further advised, as an enhancement (to more accurately reflect the steam flow rates) when MSSV and AVV position indicators were installed, the duration of the release and the mass of steam per unit time would be

determined by a computer program. Toledo Edison committed to incorporate this new method into procedures at the appropriate time. The NRC concurred with TE's response by letter dated November 25, 1987, (Log Number 2447) stating that the instrumentation provided by this variable was acceptable based on TE's justification and procedures.

Implementation of the enhanced method was dependent upon installing MSSV position indication. Since TE no longer plans to install MSSV position indicators, TE has re-evaluated the current method of assessing radioactive release to ensure its adequacy. Toledo Edison has concluded that there would be little or no increase in the accuracy of determining radioactive releases by using MSSV position indication. Use of the open/closed position indication of the MSSV would not necessarily reduce the overall uncertainty associated in estimating the radiation releases and the resultant dose. The uncertainty in estimating mass flow through the MSSVs is insignificant if compared to the uncertainty of other factors associated with the estimation of resultant doses (e.g., source term, atmospheric dispersion, iodine partition, etc.). Davis-Besse emergency planning procedures provide guidance in estimating realistic steam releases through the MSSVs. This guidance includes monitoring of feedwater flow to the steam generator, and estimation of steam releases based on decay heat. The procedures do not rely on the status of the MSSV position. Use of these different parameters in estimating the overall radiation releases would be more realistic than the releases that could be calculated using open/closed MSSV position indication. Therefore, utilizing a method that uses direct MSSV position indication as an input for assessing releases would be of no real benefit.