UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 2, 2000

LICENSEE: Commonwealth Edison Company

FACILITIES: Dresden Nuclear Power Station
LaSalle County Station
Quad Cities Nuclear Power Station

SUBJECT: SUMMARY OF APRIL 27, 2000, MEETING WITH COMMONWEALTH EDISON COMPANY TO DISCUSS THE CONVERSION TO IMPROVED TECHNICAL SPECIFICATIONS AND THE CONVERSION TO 24-MONTH SURVEILLANCE INTERVALS FOR DRESDEN, UNITS 2 AND 3, LASALLE, UNITS 1 AND 2, AND QUAD CITIES, UNITS 1 AND 2 (TAC NOS. MA8378, MA8379, MA8380, MA8381, MA8382, MA8383, MA8384, MA8385, MA8387, MA8388, MA8389, AND MA8390)

On April 27, 2000, the U. S. Nuclear Regulatory Commission (NRC) met with the Commonwealth Edison Company (ComEd) to discuss the conversion to the Improved Technical Specifications (ITS) and the conversion to 24-month surveillance intervals for Dresden Nuclear Power Station, Units 2 and 3, Lasalle County Station, Units 1 and 2, and Quad Cities Nuclear Power Station, Units 1 and 2.

The first issue discussed was ComEd's setpoint methodology that will be used to justify new technical specification allowable values and surveillance intervals. The methodology uses past surveillance/calibration data to predict how the instruments will behave when the surveillance interval is increased from 18 months to 24 months. New values for instrument uncertainty and drift are determined for the longer interval. These are then applied to the limits in the safety analysis to calculate the technical specification allowable values. ComEd's methodology was submitted to the NRC by letters dated March 3 and March 24, 2000. The staff discussed some clarifications on the setpoint methodology and discussed how the method is being applied to increase the surveillance interval. The staff does not have any concerns about the methodology. ComEd committed to clarify some items and re-submit the methodology.

The staff also discussed some clarifications on ITS Sections 3.3 and 3.8. For both of these sections the review is still in progress. On Section 3.3 the clarifications were straight forward. On Section 3.8 the reviewer presented several items for ComEd to consider. The reviewer's concern is the uniqueness of the Quad Cities design verses the standard plant. This makes it hard for the standard technical specifications to work effectively. ComEd stated that the Quad Cities design is similar in many aspects to other similar-vintage plants that have already converted to ITS. ComEd and the staff intend to discuss the review of Section 3.8 in more detail approximately two weeks after the meeting.

A list of those attending the meeting is provided as Enclosure 1. The slides used by ComEd during the meeting are provided in Enclosure 2.

Stewart N. Bailey, Project Manager, Section 2
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos.: 50-237, 50-249, 50-254, 50-265, 50-373, 50-374

Enclosures: 1. Meeting Attendees
2. Slides

cc w/encls: See next page

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/RA/

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MEETING TO DISCUSS IMPROVED TECHNICAL SPECIFICATIONS AND THE CONVERSION TO 24-MONTH SURVEILLANCE INTERVALS
APRIL 27, 2000

NAME	AFFILIATION
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ENCLOSURE 1

ComEd Setpoint and Uncertainty Methodology As Applied to Improved Technical Specifications and 24-Month Cycle Extensions

April 27, 2000

NRC

Rockville, MD.

Basic Requirements

- Computing or Confirming Allowable Values for Improved Technical Specifications

- Evaluating Actual Plant Data and Revising Setpoints in accordance with Generic Letter 91-04, "Changes in Technical Specification Surveillance Intervals to Accommodate a 24 Month Fuel Cycle"

ComEd Position on Setpoint Methodology

- Two Members on the International Society for Measurement and Control (ISA) S67.04 Committee

- Provided Significant Input and Review to EPRI TR-103335, "Guidelines for Instrument Calibration Extension/Reduction Programs"

- ComEd Setpoint Methodology (Nuclear Engineering Standard NES-EIC-20.04)
  - Based on ISA – S67.04, Part I – 1994, "Setpoints for Nuclear Safety-Related Instrumentation," and ISA – RP67.04 – Part II –1994, Methodologies for the Determination of Setpoints for Nuclear Safety-Related Instrumentation"

Specific Strengths of ComEd Setpoint Methodology

- Rigorous Control of Random and Non-Random Terms Including Defining Expected Form of Most of the Uncertainties Evaluated (Appendix A)

- Defined Combinations of Uncertainties for Loop Related Values (Appendices B and C)

- Specific Guidelines for Determination of Drift As a Function of As-Found/As-Left Data from Calibrations (Appendix J)

- Continuing Program of Trending Instrument Performance Implemented at All Sites

Specific Strengths of Trending Program

- Ties Problem Identification Forms (PIFs) to Exceeding Expanded Tolerance (ET) Values
- Defines ET and Setting Tolerance (ST) Determination Methods
- Requires Continuing Update of 24-Month Drift Analysis

Improved Technical Specifications and 24-Month Cycle Extension Activities Different from Those Previously Submitted

24-Month Analysis of As-Found/As-Left Data

- Data From Instrument Calibrations Evaluated for Support of Cycle Extension
  - Supports the Seven Steps Listed in Generic Letter 94-01
- Process Described Appendix J of ComEd Setpoint Methodology Utilized
  - Patterned After EPRI-TR-103335 Revision 1
- Supplemental Project Technical Plan Required by Appendix J of ComEd Setpoint Methodology Prepared and Utilized

Data Collection

- Data Collected from All Representatives of the Instrument Make and Model of Interest

- Data from at Least Five Calibration Intervals Collected to Obtain Sufficient Data
  - ComEd Engineering Judgment - Greater Than 20 Data Points

- Implicit Assumption
  - Each Unit of a Given Instrument Make and Model will Generate Independent Data Points for the Generic Instrument Make/Model Value

Outliers

Data Not Used If the Following Could Be Shown

- Calibration Was Performed With Faulty Equipment
  - Either Known Measurement and Test Equipment (M&TE) Problems or Jump on One Calibration and Jump Back on the Next Calibration
- Corrective Calibration As a Result of a PIF
  - Error Was Detectable by Operations

Once Converted to Drift, Data was Statistically Screened for Outliers

- Few Outliers Would Be Removed Using This Process, However an Allowance to Remove Up to 5% of the Data Was Provided
  - Statistical Removal of Less Than 5% of the Data Provides Better Evaluation of Expected Drift and Thus Provides Earlier Warning of Failing Instrumentation

Pooling

- Reducing the Critical T Value in the Outlier Test Until at Least 10% of the Data Points Indicated As Outliers
  - These Data Points Reviewed to Determine If One Component or One Application Was the Source of the Majority of These Data Points
  - If Any Pattern Was Detected, Then Further Pooling Analysis Was Performed
  - This Process Detected Two Bad Instruments
    - Use of Capillaries on One Application of a Transmitter and the Effect of Turndown on Rosemount 1153 Transmitters.

- For Some Sets of Data, There Was Not Enough Calibration Information
  - In These Cases, Each Plant Either Reverted to Vendor Documentation for the Drift or Pooled Data With the Other ComEd Boiling Water Reactors
  - Use of Data From Sister Plants Using the Same Calibration System, M&TE Calibration Lab, and Procurement System, and Operated in Similar Environments, Should Provide a Good Representation of the Data.
  - To Verify the Pooling of the Different Plant Data, a Formal Critical T-Test Performed

Normality

- Data Tended to Have High Kurtosis and Thus Seldom Passed Chi-Square, W or D-Prime Tests
- Probability Plots and Histograms Used to Evaluate "Near Normal" Conditions
- Standard Deviation on Trial Normal Curve on Histogram Adjusted As Required to Ensure 95/95 of Data Population Was Represented

Time Dependency

- Simple Regression Evaluation of the Drift Data Set Would Not Provide Conclusive Information on Time Dependency
- A Small Number of Data Points With High Leverage at a Short or Long Calibration Interval Could Significantly Bias the Regression Result
- To Preclude These Issues from Affecting Regression Analysis, Steps Were Taken in the Following Areas
  - Functional Binning
  - Regression

Functional Binning

- Calibration Data Will Occur at Set Intervals
  - Normally: Weekly, Monthly, Quarterly, Biannually, Annually, Eighteen Months and Longer
- Data Divided Into Interval Bins to Place Like Data in the Same Bin
- To Limit High Leverage Points Only Bins With a Significant Amount of the Data Evaluated
- If the Bins Are Not Contiguous, Then Intervening Bins Included
- If Only One Bin Holds Majority of Data, Then Only That Bin Evaluated

Regression

- Regression Only Used for Valid Bins
- Adjusted R-Square Value in Excess of 0.3 Used for Determining Relevance
- Regression of the Absolute Value of Data Performed
  - Used to Detect Increasing Standard Deviation With Interval
- If Drift Uncertainty Was Expanding With Time, an Adjusted R-Squared Value Greater Than 0.3 Would Show Significance

- Another Check Was Conducted Beyond This Regression to Continue to Check for Time Dependency
  - Each Significant Bin's Mean and Standard Deviation Determined
    - Values Plotted
  - Visual Evaluation of the Bin Mean and Standard Deviation Plot Performed
    - Obvious Increases in Either Mean or Standard Deviation With Calibration Interval Would Make Overall Drift Value Time Dependent
  - For Multiple Calibration Points, the Point That Shows Largest Standard Deviation Will Be the Only One Evaluated
  - If Time Dependency Was Determined, Then Result of the Regression of All Valid Data Would Be Used for the Time Dependent Equation

Results/Extrapolation of Drift Values

- Final Drift Value Contains
  - A Bias Term That is the Constant of the Regression or the Mean of the Data (If Greater Than 0.1% of Span)
  - A Random Uncertainty That is the 95/95 Value for the Number of Data Points That Were Evaluated

- Normally Data Will Not Be Available From the Bin That Contains the Two-Year Calibration Interval

- A Method to Determine the Value for Drift at the 30-Month Point
  - For Time Independent Data
    - Allow Extrapolation to One Bin Either Side of the Valid Interval by Adjusting Values to Account for Any Expansion of Mean or Standard Deviation Found in Evaluation of Bin Means and Standard Deviations
    - For Longer Extrapolation or for Single Bin Analysis
      - Random Elements Will Be Expanded on a Square Root Sum of the Squares Basis and Mean Will Be Considered Constant
  - For Time Dependent Data
    - Extrapolation Will Be Linear by Period
    - Conservative Assumption Based on Current Data

Utilization of 24-Month Computed Drift in Current Setpoint Determinations

- Calculated Drift Tolerance Interval (DTI_C) is Term If Drift is Computed from As-Found/As-Left Data
- Vendor Drift Tolerance Interval (DTI_V) is Term That Represents Drift That Was Assumed in Previous Setpoint Calculation
- Comprised of Four Uncertainties
  - Drift
  - M&TE
  - Reference Accuracy
  - Setting Tolerance
- Other Terms Are Not Included and Must Be Accounted for As Separate Items in Calculation.

Determining if a Calculation Revision is Necessary

- Current Value of DTI_V is Compared to Value of DTI_C
  - If the DTI_V Term is Larger, Then No Revision Is Required to the Calculation to Account for Extension to 30-Month Calibration Intervals
  - If the DTI_C Term is Larger, Then the Terms That Comprise DTI_V Will Be Removed from the Calculation and Value of DTI_C Will Be Used

- Depending on the Amount of Revision Required to Existing Calculations, Either a Design Change Request is Issued for Revision or a Complete Revision is Prepared

Determining the Nominal Trip Setpoint (NTSP) and Allowable Value (AV)

- ComEd Uses Method 3 of ISA – RP67.04 – Part II –1994 for Computing AV
  - NTSP = Analytical Limit – Total Channel Error
  - AV is Computed by Adding DTI_C to the NTSP
- This is a Conservative Approach for AV
  - As There Are Other Uncertainties That Are Measured During Calibration
- This Means That the AV is a Term for the Whole Loop for the Calibration Interval

Determining and Using ET

- ComEd Has Developed an Instrument Trending Program
- Requires an ET (As-Found Limit) for Calibration
  expanded tolerance
- Computed from the Limiting Values of NTSP, DTI_V, and DTI_C
- Tolerance is Placed Around the Field Setting of the Setpoint
  ID instrument that is going bad
- Tolerance Provides a Comparison Between Expected Performance and Actual Field Performance

not necessarily change field setpt
field setpt not necessarily = calculated setpt
app/ OTI to field setpt, vs using AV, do determine bad instr.

Submittal Schedule

- June 5, 2000 - Results from First Group of Calculations to Be Submitted
  - Resulting Changes to AVs and Surveillance Frequencies

- September 15, 2000 - Results from Remaining Calculations, Which Mainly Involve Time Delay Relays and Mechanical Devices, to Be Submitted
  - Resulting Changes to AVs and Surveillance Frequencies

Calculation Examples Available for Review