QC 262

UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, D. C. 20555

June 6, 2000

MEMORANDUM TO: Graham Wallis, Chairman, Thermal-Hydraulic Phenomena Subcommittee

FROM: P. Boehnert, Senior Staff Engineer

SUBJECT: NRR MEETING WITH COMMONWEALTH EDISON COMPANY (COMED) ---- CORE POWER UPRATE PROGRAM FOR DRESDEN AND QUAD CITIES PLANTS, MAY 31, 2000, ROCKVILLE, MARYLAND

Representatives of NRR and ComEd met on May 31, 2000 to hold a "kick-off" meeting to discuss ComEd's licensing plan to support extended power uprates for Dresden Units 2 & 3 and Quad Cities Units 1 & 2, as well as transition to use of GE14 fuel. Key points noted during the meeting include:

- ComEd will transition to use of the new GE14 fuel design in all its BWR units. Currently ComEd's BWRs are using a mix of GE and Siemens ATRIUM-9B fuel. Discussion ensued over GE's plans to apply its GEXL critical-power ratio calculation methodology to the Siemens fuel type, absent knowledge of its design/test parameters, which are held proprietary. GE explained that they would need to perform a series of interpolative calculations which ComEd would, in turn, need to evaluate, since they have access to the Siemens proprietary information. NRR raised concerns regarding GE's lack of knowledge of the applicability of the Siemens design parameters to uprate power conditions, the bounding of uncertainties, as well as the overall approach being employed. The staff advised GE of the need to submit a comprehensive report on this methodology for its review, as soon as practicable.

- The Dresden and Quad Cities Units are to be uprated by 17% of the current licensed power level. ComEd maintains that the impact for an uprate of this magnitude is minimal, as substantial design margin exists in both the NSSS and balance-of-plant equipment for units of this vintage (BWR/3). In response to my question, ComEd said that both plants received 5% power uprates shortly after initial licensing, pursuant to AEC practice at that time (early 1970s). Technically, this power increase represents an overall uprate of 22% above the initial licensed level. Given this, the staff requested that ComEd address the applicability of the GE generic analyses supporting the Extended Uprate Program, as this Program was limited to uprates of no more than 20% of nominal power.

Dresden
Quad Cities

A list of significant plant modifications was provided (Figure 1). Regarding the need for additional cooling towers at the Dresden site, NRR cited a concern with the impact of the site's heat rejection capabilities during high temperature conditions on such plant parameters as suppression pool temperature limits (e.g., elevated spray pond temperatures). The licensee has not yet performed the safety analyses supporting the uprate; therefore, additional modifications may be necessary.

- ComEd discussed its approach for the safety analysis supporting the uprates for the four units. Designated "Unit 5", it will consist of a set of bounding inputs for the safety analyses and use of the MELLL (maximum extended load line limit - Figure 2) for plant operation at the increased power level. Figure 3 provides some additional details on the Unit 5 approach.

- The licensee intends to submit its uprate license amendment request by the end of this year. NRC review would need to be completed within ~ eight to nine month's time to support the proposed restart schedule for the first uprated unit, Dresden Unit 2, in November 2001. I made note of the ACRS's intention to review this uprate application, and the need to include time for Committee review in the above schedule. ACRS Fellow G. Cronenberg indicated that the Committee is concerned with the lack of a NRC review plan (Standard Review Plan Section) for power uprates[1]. ComEd indicated that they will be in a position to uprate the plants in mid-cycle, if necessary, given any review schedule delays.

- During discussion, ComEd noted that the cost of the uprate power is ~$175/kW(e).

Attachments: As Stated

cc: Balance of ACRS Members
R. Savio

cc w/o attach (via E-mail):
J. Larkins
H. Larson
S. Duraiswamy
ACRS Technical Staff & Fellows

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[1] Subsequent to the meeting, Dr. Cronenberg and I discussed this matter with Mr. Duraiswamy. I sent you an E-Mail message recommending that the Committee engage the staff in a dialogue on the need for development of a Standard Review Plan for review of power uprates. You indicated support of this approach. The P&P Subcommittee is scheduled to discuss this matter during its June 6, 2000 Meeting.

Significant Modifications

- Replace HP turbines
- Add new condensate demineralizers
- Recirculation pump runback on FW or CD pump trip
- Off gas temperature conditioning
- Heater drain valve replacements
- Auxiliary power system changes
- Instrument setpoint changes
- Additional cooling towers at Dresden

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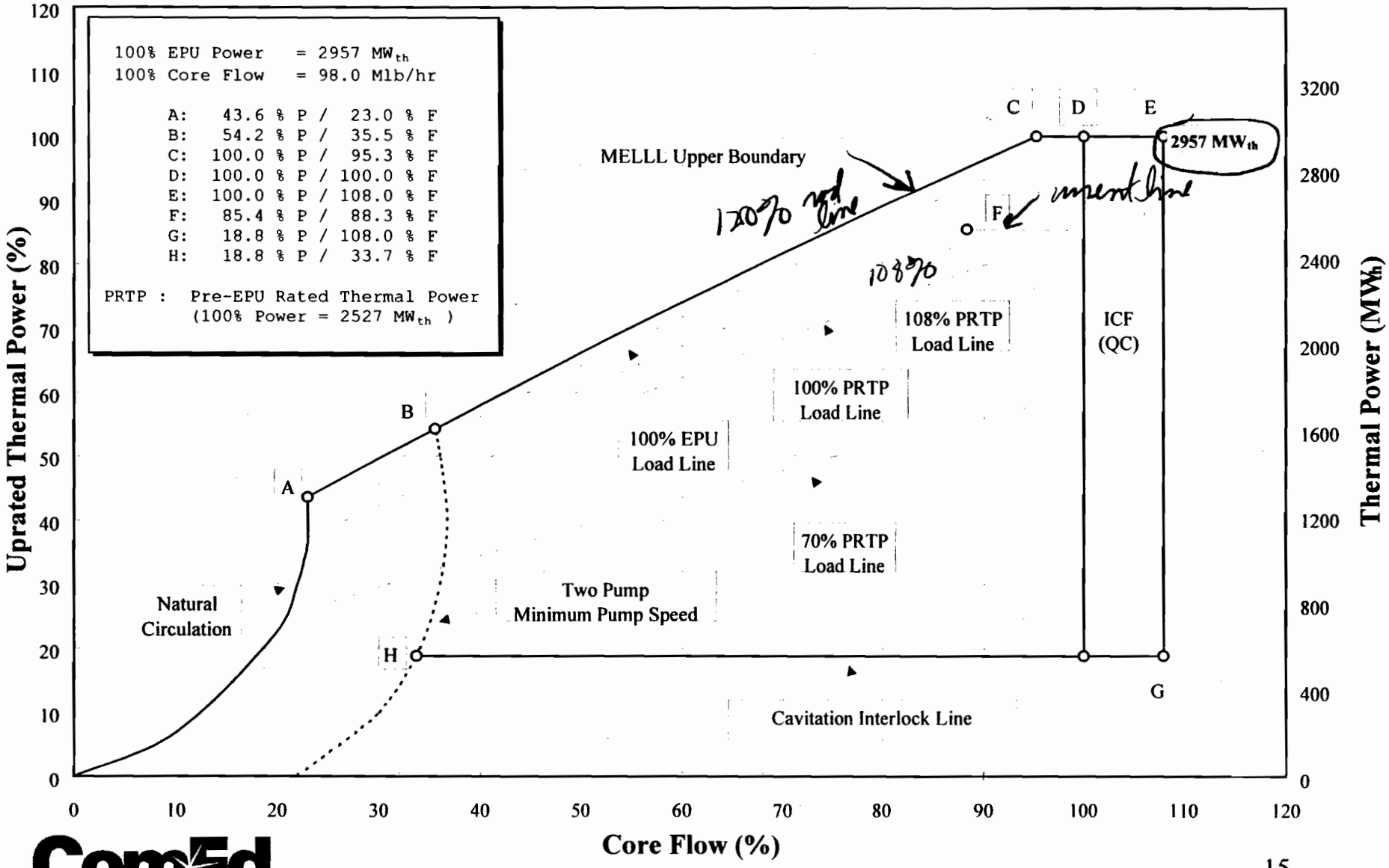
~~Full~~ Repl. done on fuel outages

Dresden and Quad Cities MELLL Power/Flow Map



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Unit 5 Analytical Approach for DR/QC

P16.3

- What is Unit 5?
  - A bounding set of analysis inputs for the four Dresden and Quad Cities units for EPU/MELLL SAR (e.g. LOCA, containment analysis)
  - Safety analysis results/impacts due to EPU/MELLL will be presented in the PUSAR for review and approval
  - Unit/cycle specific models will be used for reload safety analyses according to the NRC-approved methods
- Why Unit 5?
  - Only a few differences between the four units (typical BWR3)
  - More efficient analysis and review
  - Common design bases for consistency and maintenance
  - Uprated core thermal power will be the same for all four units
- How?
  - Current safety analysis inputs of the four units were compiled/reviewed
  - Unit 5 model jointly developed by ComEd/GE by selecting the limiting parameter(s)
  - Justification for choice of limiting parameter compiled
  - Parameter choice is dependent on analysis

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