



February 23, 2000  
LD-2000-0012

U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, D.C. 20555-0001

Subject: **Criteria for a Licensee Performing Thermal Hydraulic Analysis  
Using TORC or CETOP-D Codes with the ABB-NV and ABB-TV  
CHF Correlations**

Greetings:

In June 1999, ABB CENP submitted Topical Report CENPD-387, "ABB Critical Heat Flux Correlations for PWR Fuel," for Staff review and approval. During this review, the staff identified a need to understand the method used by ABB to ensure that Licensees are properly trained in the application of this methodology. The following discussion, forwarded for staff information, is non-proprietary and provides details on the method used by ABB to instruct licensees in certain reload analyses.

Licensees must successfully complete a technology transfer program in order to perform their own thermal hydraulic (TH) calculations using the ABB TORC and/or CETOP-D codes in support of a reload analysis. This program consists of the following elements:

#### **Training**

The initial phase of technology transfer includes classroom training on the TORC/CETOP-D calculational methodology (theory) and application methodology. This training also includes hands-on exercises.

The classroom training is followed by on the job training (OJT). This consists of completion of an actual TH analysis using TORC/CETOP-D with the ABB CENP application methodology. This analysis is performed under the supervision of an ABB CENP engineer.

#### **Benchmarking**

Following successful completion of OJT selected trainees complete a TH analysis in support of a reload with limited ABB CENP support. ABB CENP engineers then

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perform a detailed engineering review of the completed analysis to ensure the quality of the work and check for technical weaknesses in the application of the approved methodology. This engineering review is performed to the standards defined by 10CFR50, Appendix B.

Upon satisfying the above requirements, ABB CENP issues a letter to the licensee confirming that technology transfer in the TH area has been successfully completed. To date several licensees have successfully completed technology transfer; we refer to these licensees as "TH Qualified". No licensee is granted the status of TH Qualified without a quality assurance program in place that meets the requirements of 10CFR50 Appendix B.

Training of new engineers is the responsibility of the TH Qualified licensee. ABB CENP will participate in this training activity at the request of the licensee.

### **Change Control**

TH Qualified Licensees are notified of any significant changes in application methodology. Upon request such methodology upgrades are provided to the TH Qualified licensee. Minor code upgrades that do not involve a change in application methodology are provided to the licensees along with updated user documentation, a release notice detailing the nature of the code modification, and any special instructions for use of the updated code.

### **Application to New CHF Correlations**

The ABB-NV and ABB-TV CHF correlations have been implemented in the TORC and/or CETOP-D codes as an option; this option is fully documented in the TORC and/or CETOP-D user documentation. With the exception of the option flag to activate the correlation, no change in application methodology is required.

Implementation of ABB-NV and ABB-TV in the TORC and CETOP-D codes meets the standard of a minor code upgrade. Any TH Qualified analyst is considered to be qualified to apply the new correlation in reload analysis subsequent to review of the TORC release notice and updated user documentation.

ABB CENP will independently perform a benchmarking calculation for comparison to licensee results for the initial application of the new CHF correlations. This comparison must verify that the new correlations are being properly applied prior to continued use.

All calculations applying the new CHF correlations in a reload, using the ABB CENP methodology, shall be conducted by the licensee under the control of a quality assurance program which meets the requirement of 10 CFR 50, Appendix B. The licensee QA program will also include provisions for implementing changes to methods and for informing ABB CENP of any problems or errors discovered while using the methods. The ABB CENP QA program also includes the same provisions. All reported errors are entered into the ABB CENP Corrective Action Program for tracking and resolution purposes.

**Summary**

ABB CENP conducts technology transfer programs in the TH area, which include classroom training, on the job training, and benchmarking. Upon successful completion of this program the licensee becomes TH Qualified to independently perform TH analyses with the TORC and/or CETOP-D codes under an approved 10CFR50, Appendix B quality assurance program.

The new CHF correlations will be supplied to TH Qualified licensees upon request. Formal training is not required since the application methodology is unchanged and the TORC/CETOP-D calculational methodology is essentially unchanged. For the initial use of the ABB-NV or ABB-TV correlations, ABB CENP will perform an independent benchmarking calculation for comparison to the licensee-generated results to verify the new CHF correlations are properly applied. All calculations applying the new CHF correlations in a reload shall be conducted under the control of a quality assurance program which meets the requirement of 10 CFR 50, Appendix B.

The QA programs shall include provisions for implementing changes to methods and for informing ABB CENP of any problems or errors discovered while using the methods. All reported errors are entered into the ABB CENP Corrective Action Program for tracking and resolution purposes.

Please feel free to contact Virgil Paggen of my staff at 860-285-4700 or me if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Virgil Paggen for".

Ian C. Rickard  
Director, Nuclear Licensing

copy: M. S. Chatterton (NRC)  
J. S. Cushing (NRC)