



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

September 24, 1970

R. C. DeYoung, Asst Dir, PWks, Division of Reactor Licensing  
THRU: Charles G. Long, Chief, PWR Project Branch 2, DRL

NOTES ON ACRS SEPTEMBER 17, 1970 MEETING ON OCONEE, DOCKETS 50-269,  
50-270, AND 50-287

Executive Session

Copies of ECCS Amendment No. 21 were made available to the Full  
Committee (just filed by Duke).

Staff Session

Project Leader, using viewgraph, identified items resolved since  
August Full Committee meeting and items resolved since September 9  
Subcommittee meeting.

Mr. Long told the Committee that the staff had reviewed a draft of  
Amendment No. 21 and we now considered the ECCS review on Oconee com-  
plete for licensing purposes. Dr. Rosen informed the Committee that he  
considers the core coolable, although he does not agree with the consensus  
of the people who attended the INC meeting in August that the RELAP-3  
work is an adequate basis for such a conclusion.

We also told the Committee that hydrogen control, if required by  
the staff, will be on the backfit rule basis. We are expediting our  
review of this but do not intend for it to delay the licensing procedure.

We also told the Committee that we are approximately 80% complete  
in our tech spec review and that we expect to have a complete draft in  
about a month and a half.

We informed the Committee that B&W's diverse reactor trip for use  
with ECCS is unacceptable but see no practical problem in getting an  
acceptable diverse trip (low reactor coolant flow, or high containment  
pressure).

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The Committee asked a number of questions.

1. Spent Fuel Pool Doses - Staff Position.

Mr. DeYoung stated that either filters or fuel pool water partition factor credit are expected to reduce doses at Oconee to an acceptable level for the fuel handling accident (30 Rem 2-hour thyroid dose with addition of filters or 20 Rem 2-hour thyroid dose with additional water partition credit). Both filter and partition credit will not be required.

2. Containment Pressure Margin Philosophy

We stated that at CP approval containment had a 9-1/2% margin. That identification of the steam generator F. W. ring failure potential essentially used up that margin. We also stated that it is our position with current applicants to require a 10% margin based on secondary system being designed not to fail. We said state of construction at Oconee Units 1, 2 and 3 preclude design changes to significantly increase design pressure.

3. Single-Loop Operation - Manual Reset of Trip Points

In addition to assuring the Committee that single-loop operation will not be permitted until tests are performed, we told the Committee that manual reset of trip points with the reactor shutdown were acceptable in converting from two-loop to one-loop operation. Single-pump operation will not be licensed.

4. New Regulatory Criteria Since CP Review That Might Be Imposed on Units 2 And 3

Mr. Long responded by stating that Duke has revised their plant design to accommodate a majority of the new criteria that we presently invoke

on new applicants such as In-Service Inspection, B31.7 piping requirement, etc, and that we could only find two criteria they do not or may not meet:

- (1) The reactor cavity has been designed to withstand a  $8.5 \text{ ft}^2$  break without loss of flooding. While today we would require ultimate structural capability to withstand a  $14.1 \text{ ft}^2$  break. Although the Duke design's ultimate capability is larger than  $8.5 \text{ ft}^2$ , we have not required it to be evaluated at  $14.1 \text{ ft}^2$ . Dr. Siess commented that additional reinforcing steel in the cavity concrete structure could probably add significant additional withstand capability.
- (2) Containment pressure 10% margin for unknown energy sources. Mr. Long stated that at the CP stage we had close to this (9.5%). Construction is too far along to significantly regain this margin on Units 2 and 3.

#### Applicant Session

Bill Lee made a plea for one letter covering all three Oconee units.

B&W presented their ECCS data and discussed why they were not ready at the September 9, 1970 Subcommittee meeting. The key breakthroughs that resulted in Amendment 21 were (1) verification that ASME steam table equations are valid above  $2500^\circ\text{F}$ , (2) simplification of core model (reverted back to modeling a hot channel instead of a hot bundle), and (3) decision that all volumes could be considered homogeneous. In response to ACRS questions, C. Parks said use of a  $+0.9 \times 10^{-5}$  positive moderator coefficient would result in about a  $+25^\circ\text{F}$  rise in peak fuel temperature during the accident. Dr. Isbin commented that assumption of a high heat transfer coefficient early in the blowdown might not be conservative if it caused steam blanketing. C. Parks noted that the vent valves in the Duke vessel would prevent steam binding. Dr. Okrent asked about fuel blockage effects

on peak fuel temperature. C. Parks referred to Government laboratory tests which suggest such blockage actually may reduce fuel temperature but that this is not well understood.

In response to Dr. Okrent's questions, B&W stated that thermocouples in Oconee Unit 1 are expected to last for 5 years and Duke said they will keep them in the core. While the containment penetration and plant computer for Units 2 and 3 are not designed to accept TC's in the core, the reactor pressure vessel instrument penetrations (in-core flux monitors) are available.

Dr. Okrent probed Duke on their commitment and activity in seeking a workable in-service vibration monitoring technique to detect loose core internals. Duke said they are actually looking, will welcome information, but have found nothing to date to do the job.

Dr. Stratton asked if Duke intended to use (or had capability to use caustic mix tank inventory to control spray pH to reduce iodine in containment. Duke responded by saying they are following Battelle work which indicates dose reduction of 4 to 5 for acid sprays.

#### On Radioactive Waste Release Management

Duke stated they intend by administrative procedures to release at 1% of Part 20 for both liquids and gases. Liquid release will be based on 30 cfs tailrace dilution with no credit for hydro plant operation. They still want 10% Part 20 for Tech Specs, however, which is at odds with the staff position expressed to both Duke and the ACRS (1% of Part 20 except 100% Part 20 for brief intervals of approximately 15 minutes to handle unusual emergencies).

B&W presented their case for the power-to-flow scram as the diverse reactor trip for use with ECCS. They stated orally that it would withstand the accident environment for 35 seconds. Under questioning, they could not give assurance that, for breaks between 0.4 and 5 ft<sup>2</sup>, fuel peak temperatures would remain low (on the order of 1700°F). Bill Smith indicated that B&W was not willing to test the flux detectors for 35 seconds to demonstrate ability to withstand this environment.

Duke stated that they had measured compressive and tensile strength of test cylinders of the Oconee Unit No. 1 dome concrete and obtained 28-day strengths of 5838 to 7428 psi and 525 to 674 psi, respectively. Dr. Siess questioned whether the "Soniscope" technique used on the base slab at Turkey Point had been considered as a technique to probe for voids or delaminations. Duke said they will "do anything reasonable to assure a safe building" and that to date they had vigorously pursued this matter with no basis to conclude they have a problem similar to the Turkey Point problem.

The Committee inquired about the use of Fracture Toughness in determining stresses in the reactor coolant system during heatup and cooldown. Duke said the staff had made them aware of a concern in this area and they will work with us to resolve the matter in the Tech Specs.

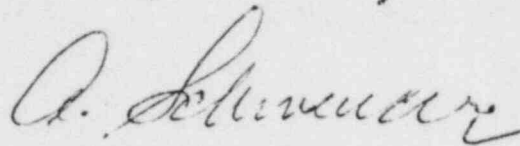
Dr. Okrent asked about doubling the relief capacity of the pressurizer safety valves. B&W said major rework would be required of some if not all affected components--the pressurizer nozzle size or quantity would have to be increased and the quench tank and quench tank cooling system would have to be enlarged.

Dr. Okrent asked if B&W could think of ways to more rapidly inject boron into the core following a LOCA. B&W responded that one obvious concept that might be examined is the Westinghouse scheme of adding a pressurized tank of high concentration boric acid in the high pressure injection line.

On the ATWS schedule, Bill Smith of B&W stated that they were awaiting further guidance from the regulatory staff before proceeding with analyses which prohibit control rod motion.

Post Caucus

After caucus ACRS Chairman, Dr. Hendrie, stated the Committee expected to be able to write a letter which would have a number of statements including one on the remaining documentation on B&W's ECCS analysis. The letter will cover Unit 1 only.



A. Schwencer  
PWR Project Branch 2  
Division of Reactor Licensing

Enclosure: Attendance List

Distribution:  
Dockets (3)  
DRL Reading  
PWR-2 Reading  
P. A. Morris  
F. Schroeder  
T. R. Wilson  
R. S. Boyd  
R. C. DeYoung  
D. Skovholt  
E. G. Case, DRS  
R. R. Maccary  
Compliance (2)  
DRL, DRS Br. Chiefs  
A. Schwencer  
F. W. Karas (2)  
R. W. Klecker

ATTENDANCE LIST

OCONEE-ACRS MEETING, SEPTEMBER 9, 1970

Duke Power Company

James Wyatt Hampton  
Lionel NMN Lewis  
William Oscar Parker, Jr  
Warren Herbert Owen, Jr  
Paul Hodges Barton  
Austin Cole Thies  
William States Lee  
Charles Joseph Wylie  
Linwood Clayton Dail  
Carl Amos Price  
Kenneth Sink Canady  
John Edwin Smith  
Joseph Earl Biesecker  
Edwin Dean Powell  
Thomas Fulton Wyke

B&W

John Henry MacMillan  
William John Schermer  
Elbert O'Neil Hooker  
William Henry Spanglar  
Richard Nathaniel Edwards, Jr  
George Eugene Kulynych  
James Francis Mallay  
Donald Wheaton Montgomery  
Charles Evann Parks  
William Reuben Smith, 3rd  
Rudy Vaughn Straub  
Herbert Lewis Helmbrecht  
Daniel Franklin Levstek  
Robert Allen Turner

Bechtel

Martin NMN Malcom

AEC

S. H. Hanauer, DR  
P. A. Morris, DRL  
F. Schroeder, DRL  
R. C. DeYoung, DRL  
C. G. Long, DRL  
A. Schwencer, DRL  
D. F. Ross, DRL  
T. M. Novak, DRL  
O. D. Parr, DRL  
P. W. Howe, DRL  
E. G. Case, DRS  
A. W. Dromerick, DRS  
V. A. Moore, DRS  
M. Rosen, DRS  
J. Knight, DRS  
F. P. Schauer, DRS  
M. B. Fairtile, DRS  
R. J. Colmar, DRS  
M. S. Dunenfeld, DRS  
H. J. Richings, DRS  
H. Specter, DRS  
S. S. Pawlicki, DRS  
C. E. Murphy, CO, Region II