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In the Matter of Consolidated Edison Company of New York, Inc.
Indian Point Nuclear Generating Unit No. 2
Docket No. 50-247

Gentlemen:

At the session of the evidentiary hearing in subject proceeding on November 17, 1971 (Transcript pages 4128-4130) the Board requested that the regulatory staff furnish certain information relative to the water reactor safety program.

Transmitted herewith are the staff's responses to said Board questions.

Sincerely,

Myron Karman
Counsel for AEC Regulatory Staff

Enclosure
As stated

cc: See page 2

DRMuller
for R.C. DeYoung
12/27/71

OFFICE ▶	OGC MK	OGC TFE	~~DRL~~	RDT		hearing
SURNAME ▶	MKarman/rmh	TFEngelhardt	~~PAMorris~~	PRESSIESKY		
DATE ▶	12-20-71	12-20-71	~~12- -71~~	12-21 -71		

dd w/encl: J. Bruce MacDonald, Esq.
Angus Macbeth, Esq.
Anthony Z. Roisman, Esq.
Honorable William J. Burke
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OFFICE ▶						
SURNAME ▶						
DATE ▶						

Question - (Transcript pp 4128 - 4129) - Mr. Briggs

Would it be possible for the Staff to indicate to us what tests are now in progress by the AEC Laboratories to resolve the questions of the emergency core cooling system and what kind of progress is being made, what kind of schedule is being used for these tests?

I realize that you provided us with a document that tells what the water reactor safety program is, but we learned the other day that part of that safety program which had to do with flow redistribution was not funded and no indication that there was a plan to fund it. So the Board would like to have some information on the important tests that are in progress now and/or are planned and what the schedule is and what the status is on the important tests.

Answer:

The programs listed below are the currently active AEC sponsored tests designed to provide additional information on emergency core cooling effectiveness. The schedule dates shown are current estimates, how they are subject to revision as the programs progress.

LOFT SEMISCALE TESTS

1-1/2 Loop Semiscale System consisting of one operating loop and one blowdown loop and incorporating an electrically heated core will be used to produce thermal-hydraulic data to aid in code development and assessment and for design and analysis of the LOFT experiment.

Complete construction of 1-1/2 loop semiscale	11/71
Conduct preoperational testing	12/71
Initial blowdown testing	1/72
Conduct coolant injection testing	4/72
Initiate coupled blowdown and coolant injection testing	5/72

LOFT INTEGRAL TEST

A moderate sized primary reactor plant including nuclear core and containment to be used as an integral experiment to assess our ability to analyze a loss of coolant accident.

Initial criticality	12/73
Initiate LOCA nuclear testing	6/74

POWER BURST FACILITY

A facility for in-pile testing of reactor fuel behavior in either a steady state or transient mode. Tests are planned to investigate fuel failure modes, potential fuel failure propagation, and extent and effects of coolant flow blockage.

Initial criticality	2/72
Initiate testing	6/72

ADDITIONAL PWR FLECHT TESTS

Additional FLECHT tests at low flooding rates and low pressure are now in progress at Westinghouse. Tests should be completed and reported in about six months.

PWR BLOWDOWN HEAT TRANSFER

Detailed planning on these tests is currently being performed. The tests are being designed to experimentally assess transient heat transfer during blowdown. It is estimated that planning, design and construction of experimental facility, and performance of testing will require about two years.

BWR BLOWDOWN HEAT TRANSFER

A 2-year program similar to that presented above jointly sponsored by General Electric and the AEC to be performed by General Electric.

In addition, the following tests are currently being considered for performance. The dates shown are estimates.

MIXING EXPERIMENTS	INITIATE	COMPLETE
Accumulator By-Pass	4/72	6/75
Pipe Plugging (Cold water and steam mixing)	7/72	12/73
Two-Phase Pump Resistance	7/72	6/73

ANSWER:

The following testing programs related to emergency core cooling have been terminated during the past year.

FAILURE MODES OF ZIRCALOY-CLAD FUEL RODS

Work performed at Oak Ridge National Laboratory. This project was terminated as of 6/71 except for final report preparations. The basis for termination of the program is that the significant information from these out-of-pile tests was obtained and further work in this area will be performed in-pile at the Power Burst Facility.

Project Code Numbers* terminated are:

102 07 00

102 07 24

102 07 28

102 07 31

102 07 36

LOFT FISSION PRODUCT BEHAVIOR

Work performed at Idaho Nuclear Corporation (INC) and Oak Ridge National Laboratory (ORNL), terminated on the basis that sufficient information for our needs at this time has been obtained.

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* The project code numbers are as listed in the Program and Project Information File (PPIF) computer printout of the Water Reactor Safety Program status supplied by the Staff to the Board and parties on 7/12/71 in response to a Board question.

Project Code Numbers

102 14 75	INC
105 09 34	ORNL

SPRAY AND POOL ABSORPTION TECHNOLOGY

Work performed at Oak Ridge National Laboratory. This program terminated after having successfully fulfilled the significant needs in this area.

Project Code Numbers

105 17 00

105 17 04

105 17 08

105 17 41

105 17 43

The following projects in the Water Reactor Safety Program, as identified by Project Code Numbers, have been completed and, therefore, terminated:

101 10 85

101 13 68

102 09 00

102 10 24 - Completed but continuing on additional tests as noted above under PWR FLECHT tests

102 11 24

108 05 00

The following projects in the Water Reactor Safety Program, as identified by Project Code Numbers* have been terminated. Those projects already discussed above are not included in the list below.

101 08 45 - feasibility demonstrated - to be continued by industry.

101 09 48 - Closed out - to be picked up when needed by HSST program.

101 10 46 - will be part of HSST program when needed.

101 11 45 - same as 101 08 45.

102 13 00 - closed out to consolidate efforts under fewer contractors.

102 13 03 - closed out to consolidate efforts under fewer contractors.

102 13 24 - closed out to consolidate efforts under fewer contractors.

102 13 25 - closed out to consolidate efforts under fewer contractors.

102 17 56 - scoping tests completed - work extended in other programs (FLECHT, BDHT, etc.

105 14 42 - information needs at this time fulfilled.

105 15 42 - information needs at this time fulfilled.

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* The project code numbers are as listed in the Program and Project Information File (PPIF) computer printout of the Water Reactor Safety Program status supplied by the Staff to the Board and the parties on 7/12/71 in response to a Board question.

-- Question - (Transcript p 4129) - Mr. Briggs

For instance, there was some discussion the other day about whether the problems are resolved, are in hand, or we don't know much about the answers. And one example that one might take is the flow blockage problem. Is there a program within the AEC in which further information is being developed on flow blockage in-pile and out of pile, or does the AEC concur with Mr. Moore's estimate that, well, Westinghouse, let's say, has no program for investigating flow blockage and presumably considers this to be well in hand, or that there are programs to make it well in hand?

ANSWER:

Additional in-pile experimental tests of zircaloy clad fuel failure, fuel failure propagation and resulting flow blockage are currently being p[illegible] for the Power Burst Facility as presented in the answer of the first of the Board's questions in this series. Additional testing beyond this program concerning the potential for flow blockage is under consideration.

Question - (Transcript p 4130) - Mr. Briggs)

Concerning requests for information on the safety program, the information provided by the Commission, could also there be included in that information on estimate of what fraction of the Commission's safety program funds are being spent on light-water reactor safety.

ANSWER:

The Atomic Energy Commission's safety oriented programs are presently funded for fiscal year 1972 as follows:

	Dollars	Fraction
Liquid Metal Fast Breeder Reactor	16.1 million	37%
Water Reactor Safety	22.2 million	52%
Gas Cooled Reactor Safety	400,000	1%
Other (generally applicable to all reactors)	4.5 million	10%
Totals	43.2 million	100%

Therefore, 52% of the safety program funds are being spent on water reactor safety. As the category "Other" is generally applicable to all reactors, it may be concluded that 62% of the safety program funds are spent on safety of water reactors.