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FROM: Carolina Pwr & Light Co Raleigh, N.C. 27602 Mr. N.B. Bessac	DATE OF DOC 9-24-74	DATE REC'D 9-25-74	LTR X	TWX	RPT	OTHER
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DESCRIPTION:

Ltr furn info concerning the Exxon Reload Fuel Assemblies for the H.B. Robinson facility.....

PLANT NAME: H.B. Robinson

ENCLOSURES:

ACKNOWLEDGED

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Regulatory Docket File

CP&L

Carolina Power & Light Company

September 24, 1974

50-261

File: NG-3514 (R)

Serial: NG-74-1161

DOCKETED USAEC OCT 2 1974 REGULATORY MAIL SECTION DOCKET CLERK

RECEIVED SEP 25 1974 ATOMIC ENERGY COMMISSION Regulatory Mail Section

Mr. Edson G. Case, Acting Deputy
Directorate of Licensing
Office of Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

Dear Mr. Case:

H. B. ROBINSON UNIT NO. 2
LICENSE NO. DPR-23
EXXON RELOAD FUEL ASSEMBLIES

In 1973, Carolina Power & Light Company entered into contract with Exxon Nuclear Company to supply up to nine reload regions of fuel assemblies for the H. B. Robinson Unit No. 2 Plant. The first Exxon fuel region consisting of approximately one-third of the core will be inserted during the third refueling outage of the plant, which is scheduled to commence in October, 1975. The purpose of this letter is to inform you of our tentatively planned licensing activities supporting Cycle 4 operations of the Robinson Unit. In order to assure a proper and timely review of the license aspects of this fuel supplier transition, we have identified the anticipated content and schedule of information exchange for your review. This exchange will constitute the basis for mutual discussions of the licensing processes involved leading up to the assurance that the operations of the unit with the Exxon reload fuel in co-residence with the Westinghouse manufactured fuel will meet all applicable regulatory requirements.

The Exxon fuel assemblies that will be utilized in the Robinson Plant are very similar in mechanical design to those presently employed. The major differences lie in the assembly grids, which are bi-metallic (Zircaloy grid structure with Inconel springs as opposed to all Inconel grid) and a thicker fuel clad (30 mils as opposed to 24.3 mils). The grid design allows for greater neutron economy, while the higher clad thickness provides a more conservative design in relation to clad ballooning and burst during a loss-of-coolant accident, pellet-clad interaction and fuel clad collapse as a result of densification. More detailed information will be provided during the licensing process to show that the Exxon assemblies are compatible with the fuel remaining in the core and the vessel internal structures and that the mechanical, thermal-hydraulic and nuclear characteristics of the reload fuel properly assure safe and reliable operation.

9879

336 Fayetteville Street • P. O. Box 1551 • Raleigh, N. C. 27602

Carolina Power & Light Company intends to submit our application for a license change to reflect the Exxon reload fuel in June, 1975. The application will consist of a report addressing the nuclear, thermal-hydraulic and mechanical characteristics of the Exxon fuel and its relation to operation during Cycle 4, and will present the evaluation for those accidents which may be influenced by the insertion of this reload fuel. A list of these accidents is attached as Table 1. The report will also summarize the analytical methods employed in all phases of the design and accident analysis, and summarize the tests and other work performed to verify the applicability and accuracy of the methods. Any Technical Specification changes required as a result of the analyses will accompany the application.

Exxon Nuclear Company intends to conduct an extensive testing and verification program on its fuel to assure proper and conservative performance, and to assure mechanical, nuclear and thermal-hydraulic compatibility with the fuel remaining in the core. For example, a multi-rod DNB test program will be conducted to ensure that the assembly flow characteristics are conservative with respect to the DNB correlation that will be employed. It is expected, based on previous tests of similar fuel assembly designs, that the W-3 correlation will be shown to be a conservative model for the Exxon assemblies. Other tests involve mechanical wear, fretting and corrosion tests, as well as tests to assure compatibility with the RCC rods. Full scale flow tests have already been performed on both Westinghouse and Exxon assemblies to assure a matching of assembly pressure drops. The nuclear models employed in the design will be verified by comparison of analytical results and actual plant data from previous Robinson operating cycles to assure proper calculation of core power distributions, control rod worths, moderator temperature coefficients and reactivity behavior. The summaries of the test results and method and design verifications will also be incorporated in the report. A major analytical tool used in the core and boundary protection analyses is a closed-loop plant transient simulator.

A description of the model to be employed for the plant transient analyses will be available for AEC review in early 1975. Additionally, results of transient analyses performed using the PTS-PWR model and the original assumptions stated in the FSAR, for comparison of the two methodologies, will be available to assist in this review.

The attached Figure 1 provides a flow chart which shows the models to be used, the calculations to be performed and the inputs required to provide our assessment of Cycle 4 performance with respect to the ECCS Appendix K Acceptance Criteria. It is not intended that a completely new evaluation model be developed, rather, the method outlined is a differential analysis which by using results of previous analyses is designed to show that the introduction of Exxon fuel assemblies into a Westinghouse PWR with co-residing partially depleted Westinghouse assemblies does not materially affect or lead to non-conservative results for the loss-of-coolant accident.

Models employed in the ECCS analysis consist in part of RELAP4 and COBRA IIIC, which are already familiar to the AEC through your development programs. Other models identified on the figure, such as BULGEX, XTHETA and the ENC densification models, either have been or will be submitted for AEC review on a generic basis but are applicable and will be referenced for the Robinson analysis for Cycle 4.

Figure 1 also identifies two points in time at which preliminary results of the ECCS analyses will be available for review and discussion with your staff. It is hoped that these review points, in conjunction with ongoing discussions of models, methods, results, etc. during the forthcoming months, will allow the AEC to keep abreast of developments in this approach at an early point so that the planned schedule for approval of the license change application will not be jeopardized.

A summary chart of submittal dates for the various types of information discussed above is provided in Figure 2. We request that an early October date be established for a meeting among Exxon Nuclear Company, Carolina Power & Light Company and appropriate members of your staff to discuss this schedule and the information we have presented in this letter. We appreciate your attention to this matter.

Yours very truly,

N. B. Bessac
Manager
Nuclear Generation

DBW:mvp
Enclosures

cc: Messrs. W. B. Howell
J. B. McGirt
D. V. Menscer
E. E. Utley
D. B. Waters

TABLE I

ACCIDENT ANALYSES FOR RELOAD LICENSE APPLICATION

I. Core and Boundary Protection Analyses

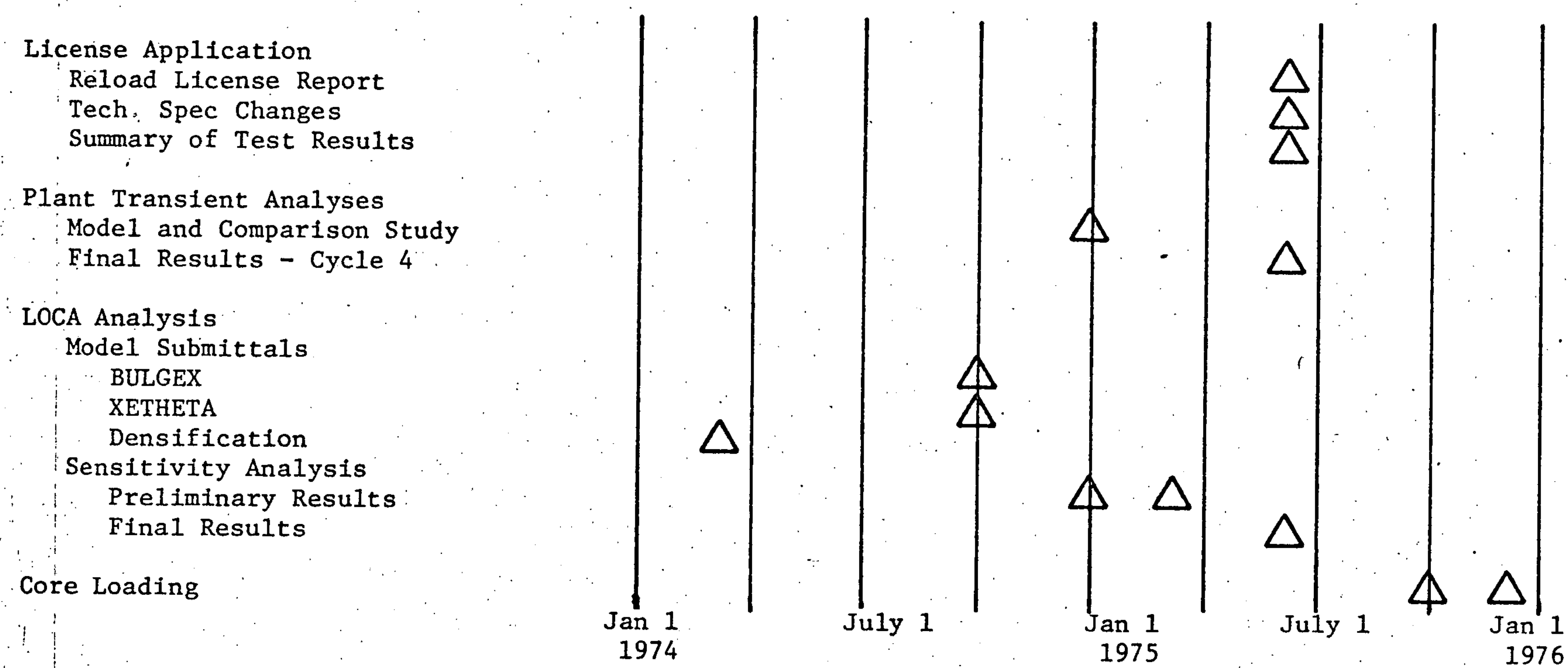
a) Uncontrolled RCCA Withdrawals
b) Malpositioning of Control Rods
c) RCCA Drop
d) Chemical and Volume Control System Malfunction
e) Startup of Inactive Loop
f) Reduction in Feedwater Enthalpy
g) Excessive Load Increase
h) Loss of Coolant Flow
i) Locked Rotor
j) Loss of Electrical Load
k) Loss of Feedwater
l) Loss of AC Power

II. Standby Safety Features Analyses

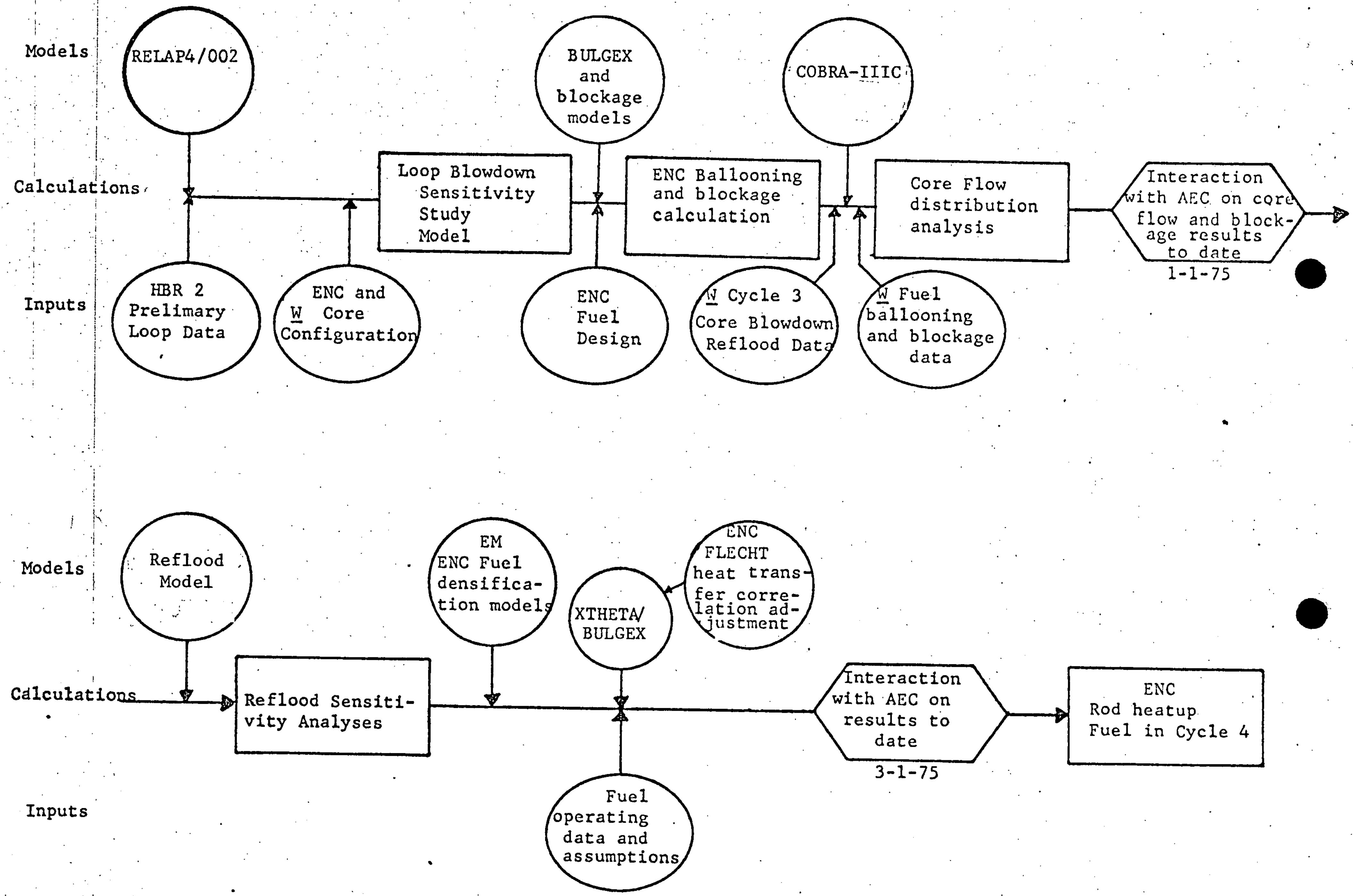
a) Fuel Handling
b) Rupture of Steam Line
c) RCCA Ejection
d) LOCA
e) Steam Generator Tube Rupture
f) Rad Waste

FIGURE 2

TENTATIVE SCHEDULE FOR RELOAD FUEL LICENSING



LOCA Sensitivity Analysis Flowchart



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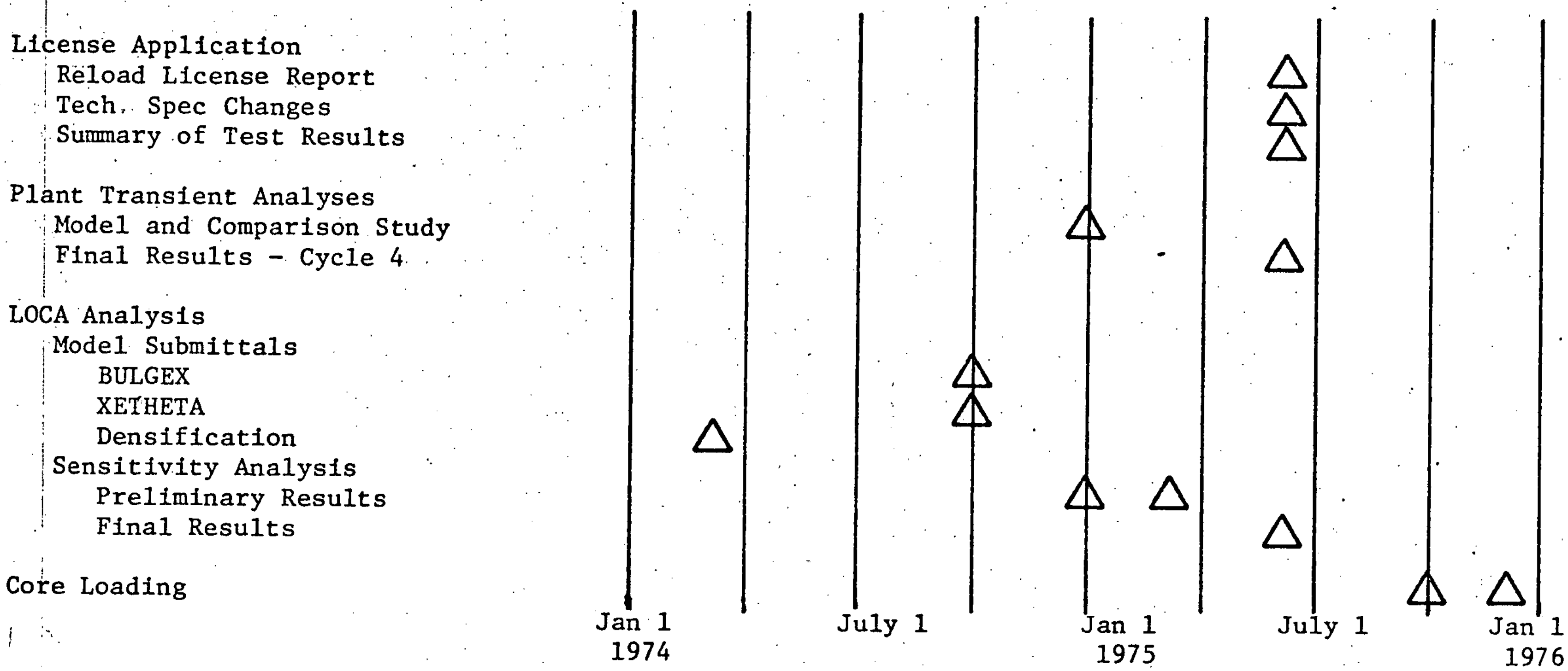

LOCA Sensitivity Analysis Flowchart