

PDR

STATEMENT OF THE
UNITED STATES NUCLEAR REGULATORY COMMISSION

BEFORE THE

SUBCOMMITTEE ON ENERGY RESEARCH AND PRODUCTION
COMMITTEE ON SCIENCE AND TECHNOLOGY
UNITED STATES HOUSE OF REPRESENTATIVES

CONCERNING
NRC'S ACTIVITIES ON ADVANCED REACTORS

PRESENTED BY NUNZIO J. PALLADINO, CHAIRMAN

SUBMITTED: OCTOBER 31, 1985

8511190046 851031
PDR COMPS NRCC
CORRESPONDENCE PDR

THANK YOU MADAM CHAIRMAN AND MEMBERS OF THE SUBCOMMITTEE. WE ARE PLEASED TO APPEAR BEFORE YOU TODAY TO DISCUSS THE COMMISSION'S PENDING POLICY STATEMENT ON THE REGULATION OF ADVANCED REACTORS. WITH ME TODAY ARE MY FELLOW COMMISSIONERS, AND MEMBERS OF THE NRC STAFF.

THE COMMISSION'S PRIMARY OBJECTIVES IN PROPOSING TO ISSUE AN ADVANCED REACTOR POLICY STATEMENT ARE THREEFOLD:

- O FIRST, TO ENCOURAGE THE EARLIEST POSSIBLE INTERACTION OF APPLICANTS, VENDORS, AND GOVERNMENT AGENCIES, WITH THE NRC;
- O SECOND, TO PROVIDE ALL INTERESTED PARTIES, INCLUDING THE PUBLIC, WITH THE COMMISSION'S VIEWS CONCERNING THE DESIRED CHARACTERISTICS OF ADVANCED REACTOR DESIGNS;
- O THIRD, TO EXPRESS THE COMMISSION'S INTENT TO ISSUE TIMELY COMMENT ON THE IMPLICATIONS OF SUCH DESIGNS FOR SAFETY AND THE REGULATORY PROCESS.

SUCH INTERACTION AND GUIDANCE EARLY IN THE DESIGN PROCESS SHOULD ENHANCE STABILITY AND PREDICTABILITY IN LICENSING AND REGULATION OF ADVANCED REACTORS.

BEFORE I DISCUSS THE PENDING ADVANCED REACTOR POLICY, I WOULD LIKE TO PROVIDE A BRIEF BACKGROUND REGARDING NRC'S PREVIOUS INVOLVEMENT WITH ADVANCED REACTORS AND THEN PROCEED TO DESCRIBE OUR CURRENT ACTIVITIES AND PLANS IN THIS AREA.

AS A STARTING POINT, I SHOULD NOTE THAT THE COMMISSION APPLIES THE TERM "ADVANCED" TO THOSE REACTORS THAT DIFFER SIGNIFICANTLY FROM CURRENT GENERATION LIGHT WATER REACTORS (LWR'S). WE INCLUDE REACTORS THAT PROVIDE GREATER MARGIN PRIOR TO EXCEEDING SAFETY LIMITS AND/OR UTILIZE INHERENT, PASSIVE, OR OTHER INNOVATIVE MEANS TO ACCOMPLISH THEIR SAFETY FUNCTIONS. ADVANCED REACTORS OF CURRENT INTEREST INCLUDE LIQUID METAL-COOLED REACTORS (LMRs), HIGH TEMPERATURE GAS-COOLED REACTORS (HTGRs) AND ADVANCED LWRs OF INNOVATIVE DESIGN (I.E., THOSE SIGNIFICANTLY DIFFERENT FROM THE CURRENT GENERATION OF POWER REACTORS).

OUR POLICY REGARDING STANDARDIZATION OF LWR TECHNOLOGY IS ONE OF STRONG ENDORSEMENT AS THE MOST REASONABLE NEAR TERM SAFETY ENHANCEMENT FROM THE DESIGN STANDPOINT. THE COMMISSION WILL MAINTAIN ITS INVOLVEMENT IN EVALUATING SAFETY CHARACTERISTICS OF STANDARDIZED REACTOR DESIGNS. INDEED, WE UNDERSTAND THAT A NUMBER OF THE DESIRABLE DESIGN CHARACTERISTICS AS SET FORTH IN THE COMMISSION'S ADVANCED REACTOR POLICY STATEMENT MAY WELL BE

INCORPORATED INTO CURRENT STANDARDIZED DESIGN EFFORTS. STANDARDIZATION WILL BE THE SUBJECT OF A SEPARATE FORTHCOMING COMMISSION POLICY STATEMENT.

THE COMMISSION HAS HAD CONSIDERABLE EXPERIENCE IN THE REGULATION OF ADVANCED REACTORS, INCLUDING THE REVIEW AND LICENSING OF HTGR'S AND LMR'S AND THE SUPPORT OF ONGOING SAFETY RESEARCH ON THESE TWO CONCEPTS. OTHER DESIGNS WE HAVE REVIEWED INCLUDE THOSE FOR THE GAS-COOLED FAST REACTOR, AND THOSE DEVELOPED UNDER THE NONPROLIFERATION ALTERNATIVE SYSTEMS ASSESSMENT AND INTERNATIONAL NUCLEAR FUEL CYCLE EVALUATION PROGRAMS (NASAP/INFCE). THE MOST RECENT ADVANCED SYSTEM WE REVIEWED WAS THE CLINCH RIVER BREEDER REACTOR (CRBR).

THE STAFF HAD ALSO INITIATED PAST ACTIONS TO ESTABLISH GENERIC LICENSING REQUIREMENTS FOR CERTAIN TYPES OF ADVANCED REACTORS. DRAFTS WERE PREPARED FOR THE HTGR AND LIQUID METAL FAST BREEDER REACTOR (LMFBR) EDITIONS OF THE STANDARD CONTENT GUIDANCE FOR SAFETY ANALYSIS REPORTS. HOWEVER, WHEN UTILITY AND GOVERNMENT INTEREST IN ADVANCED REACTORS DECLINED IN THE LATE 1970S, THESE ACTIVITIES WERE PHASED OUT. OUR POLICY IS TO PURSUE ADVANCED REACTOR ACTIVITIES CONSISTENT WITH PROGRAMS ADOPTED BY THE CONGRESS, THE DEPARTMENT OF ENERGY, OR THE PRIVATE SECTOR.

RECENT RENEWED INTEREST ON THE PART OF DOE AND BY THE INDUSTRY IN THE DESIGN AND DEVELOPMENT OF ADVANCED LWR, LMR AND HTGR CONCEPTS HAS ENCOURAGED NRC INVOLVEMENT EARLY IN THE DESIGN PROCESS TO

REVIEW THESE ADVANCED DESIGNS. THE GOAL OF SUCH EARLY REVIEWS IS THE DEVELOPMENT OF LICENSING GUIDANCE WELL IN ADVANCE OF FORMAL APPLICATION FOR A LICENSE.

HOWEVER, WHILE NRC WILL UNDERTAKE TO REVIEW AND COMMENT ON SUCH NEW DESIGN CONCEPTS, IT SHOULD BE STRESSED THAT THE APPLICANT REMAINS RESPONSIBLE FOR ALL DOCUMENTATION AND RESEARCH NECESSARY TO SUPPORT ANY SPECIFIC LICENSE APPLICATION. FOR OUR PART, NRC SAFETY RESEARCH CAN, WITH ADEQUATE CONGRESSIONAL FUNDING, PROVIDE THE TECHNICAL BASIS FOR THE REGULATORY DECISIONS THAT RELATE TO ADVANCED REACTOR DESIGNS.

GIVEN THIS BACKGROUND, I WOULD NOW LIKE TO ADDRESS THE PENDING ADVANCED REACTOR POLICY. THE NRC'S EFFORT TO DEVELOP A POLICY BEGAN IN NOVEMBER OF 1983. AFTER INITIAL STAFF WORK AND COMMISSION REVIEW, THE COMMISSION PUBLISHED FOR COMMENT A "PROPOSED POLICY FOR THE REGULATION OF ADVANCED NUCLEAR POWER PLANTS" ON MARCH 26, 1985. THE COMMISSION REQUESTED COMMENTS ON SEVERAL ISSUES BASIC TO THE DEVELOPMENT OF POLICY IN THIS AREA. THE PUBLIC COMMENT PERIOD HAS CLOSED, AND THE COMMISSION IS CONSIDERING REVISIONS TO THE POLICY STATEMENT IN THE LIGHT OF COMMENTS AND RECOMMENDATIONS FROM ITS STAFF.

THE COMMISSION BELIEVES THAT THIS POLICY STATEMENT WILL BE BENEFICIAL TO GOVERNMENT AGENCIES, TO THE NUCLEAR INDUSTRY, AND TO THE PUBLIC. IN PARTICULAR, THE STATEMENT PRESENTS THE COMMISSION'S PLANS FOR THE TREATMENT OF THE SAFETY ASPECTS OF ADVANCED REACTORS,

AND DESCRIBES CHARACTERISTICS WHICH REACTOR DESIGNERS ARE ENCOURAGED TO INCORPORATE INTO ADVANCED DESIGNS. AN UNDERLYING OBJECTIVE OF THE POLICY STATEMENT IS THUS TO ENCOURAGE THAT HIGH RELIABILITY, DEFENSE-IN-DEPTH SAFETY CHARACTERISTICS BE MAJOR CONSIDERATIONS IN ADVANCED REACTOR DEVELOPMENT. INDEED, ADVANCED REACTOR DESIGNS WHICH INCORPORATE SOME OR ALL OF THE CHARACTERISTICS OUTLINED IN THE POLICY STATEMENT CAN BE EXPECTED TO EXHIBIT GREATER MARGINS OF SAFETY THAN CURRENT GENERATION REACTORS.

DURING THE INITIAL PHASE OF ADVANCED REACTOR DEVELOPMENT, THE COMMISSION PARTICULARLY ENCOURAGES DESIGN INNOVATIONS WHICH INCREASE SAFETY AND RELIABILITY AND WHICH GENERALLY DEPEND ON TECHNOLOGY WHICH IS EITHER PROVEN OR CAN BE DEMONSTRATED BY A STRAIGHTFORWARD TECHNOLOGY DEVELOPMENT PROGRAM. IN THE ABSENCE OF A SIGNIFICANT HISTORY OF OPERATING EXPERIENCE ON AN ADVANCED CONCEPT REACTOR, THE COMMISSION URGES THAT PLANS FOR INNOVATIVE USE OF PROVEN TECHNOLOGY AND/OR NEW TECHNOLOGY DEVELOPMENT BE PRESENTED FOR REVIEW AS EARLY AS POSSIBLE, SO THAT THE NRC CAN ASSESS HOW THESE PLANS MIGHT INFLUENCE, AND BE INFLUENCED BY, REGULATORY REQUIREMENTS.

A MAJOR COMMISSION OBJECTIVE IS THE APPROVAL OF ESSENTIALLY COMPLETE STANDARD PLANT DESIGNS FOR ALL REACTORS OF THE NEXT GENERATION AND BEYOND. THOUGH WE RECOGNIZE THAT STANDARDIZATION CANNOT BE ACHIEVED UNTIL PROTOTYPES HAVE BEEN BUILT AND OPERATING EXPERIENCE HAS BEEN GAINED, CONCEPTUAL AND PRELIMINARY DESIGNS SHOULD BE SUCH THAT THEY LEND THEMSELVES TO FUTURE STANDARDIZATION.

A KEY ISSUE IN THE DEVELOPMENT OF THE POLICY STATEMENT IS THE SAFETY OBJECTIVE WHICH SHOULD APPLY TO ADVANCED REACTORS. THE COMMISSION INTENDS TO REQUIRE, AS A BASELINE, THE SAME DEGREE OF PROTECTION OF THE PUBLIC AND THE ENVIRONMENT THAT IS REQUIRED FOR CURRENT GENERATION LWR'S. BUT FOR THE LONGER TERM, THE COMMISSION EXPECTS REACTOR DESIGNS TO PROVIDE ENHANCED MARGINS OF SAFETY. THE COMMISSION INTENDS TO ISSUE, IN THE NEAR FUTURE, A SAFETY GOAL POLICY STATEMENT TO PROVIDE FURTHER GUIDANCE REGARDING SAFETY OBJECTIVES.

IN CLOSING, LET ME REEMPHASIZE THAT A PRIMARY OBJECTIVE OF THE PENDING ADVANCED REACTOR POLICY STATEMENT IS TO ENCOURAGE EARLY INTERACTION BETWEEN THE NRC AND THE AFFECTED PARTIES TO ASSURE THAT FUTURE REGULATION OF ADVANCED REACTORS IS AS FOCUSED AND ORDERLY AS POSSIBLE. REGULATORY GUIDANCE FOR SUCH REACTORS SHOULD ENCOURAGE THOSE CHARACTERISTICS THAT HAVE THE POTENTIAL FOR FOSTERING A SIMPLIFIED REGULATORY FRAMEWORK AND ENHANCED SAFETY, WHILE REMAINING SUFFICIENTLY GENERAL SO AS TO AVOID PLACING UNNECESSARY CONSTRAINTS ON THE DEVELOPMENT OF NEW DESIGN CONCEPTS. TO THIS END, THE NRC HAS ESTABLISHED A SMALL ADVANCED REACTOR GROUP IN ITS OFFICE OF NUCLEAR REACTOR REGULATION. ITS PURPOSE IS TO REVIEW ADVANCED REACTOR PROPOSALS AND TO DEVELOP REGULATORY CRITERIA BASED UPON THE SPECIFIC CHARACTERISTICS OF PROPOSED DESIGNS.

THIS CONCLUDES MY PREPARED STATEMENT. AT THIS TIME, WE WOULD BE GLAD TO ANSWER ANY QUESTIONS THE SUBCOMMITTEE MAY HAVE.