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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

DOCKETED
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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OFFICE OF SECRETARY
DOCKETING & SERVICE
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In the Matter of	)	
	)	
DUKE POWER COMPANY, et al.	)	Docket Nos. 50-413
	)	50-414
(Catawba Nuclear Station, Units 1 and 2)	)	

Motion For Authorization To Issue A License
To Load Fuel and Conduct Certain Precritical Testing

Duke Power Company, et al. (Applicants) pursuant to 10CFR 50.57(c) hereby request this Atomic Safety and Licensing Board to authorize the Director of Nuclear Reactor Regulation to issue to Applicants a license to load fuel and conduct certain precritical testing activities for Catawba Unit 1. Applicants believe that the grant of this request is warranted because (1) the activities for which authorization is sought will pose no risk to the public health and safety; (2) the contentions which are presently pending before this Board are not relevant to the authority being requested; and (3) the matters raised by this Motion are not relevant to contentions now pending before the Atomic Safety and Licensing Board convened to hear matters relating to emergency planning.

I.

The Commission's Regulations provide that Applicants may file the instant motion and, assuming the requisite criteria are met,

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that this Board may issue an order authorizing the Director to issue the license sought. The regulations further provide that

> "Action on such a motion by the presiding officer shall be taken with due regard to the rights of the parties to the proceedings, including the right of any party to be heard to the extent that his contentions are relevant to the activity to be authorized." [10CFR50.57(c)]

It should be understood clearly that what Applicants seek here is not a low-power, or "5%" license. Applicants now seek only the authority to load fuel and to conduct certain testing necessary for completion prior to achieving initial criticality. Applicants do not intend, nor do they now seek authority, to achieve initial criticality.

In general, under the authority sought, Applicants will place 193 unirradiated fuel assemblies and specified control components into the reactor vessel. At all times the core will be maintained in a subcritical condition through placement of control rods and maintenance of boron concentrations in the reactor cooling water. Boron concentrations will be maintained at a level sufficient to assure that, even in the unlikely event all control rods were withdrawn, the assemblies would not reach a critical state. Following core loading, the reactor head will be installed and a number of mechanical and electrical tests will be performed.

It is beyond dispute that such activities in and of themselves do not pose a potential threat to the public health and

safety. The Commission itself has found, in considering a request for an identical license, that

> "The risk to public health and safety from fuel loading and pre-criticality testing is extremely low since no self-sustaining nuclear chain reaction will take place under the terms of the license and therefore no radioactive fission products will be produced. [Pacific Gas & Electric Company (Diablo Canyon Nuclear Power Plant, Units 1 and 2), CLI-83-27, 18NRC____ (slip op. at p. 5) (November 8, 1983).]

Commencement of fuel load for Unit 1 is now scheduled for May 25, 1984. The activities to be conducted under the authorization sought are scheduled for completion on August 30, 1984. (See Affidavit of Warren H. Owen, served on the Board and parties by letter dated April 10, 1984.)

During at least a portion of that time, one or both diesel generators for Catawba Unit 1 will not be available for service. To be more specific, as the Board and parties were informed in Applicants' March 29, 1984 letter to the Board, Applicants are now embarked on a test and inspection program which will demonstrate the capability of the diesel generators at Catawba to perform their function. Under the current program, diesel generator 1-A, having completed a 750-hr. run, is now being disassembled for inspection, analysis, and testing. Diesel generator 1-A is to be available again for service in July 1984. Diesel generator 1-B has been run approximately 210 hours. In early May it will begin running until it has run 750 hours. Following completion of this run, which will be mid-June, diesel generator 1-B will be disassembled and inspected. Diesel generator 1-B is to be available again for service in August 1984. Under the current schedule then, from mid-June to July 1984 neither of Unit

1's diesel generators will be available for service. However, this should not weigh in the Board's decision; as shown below, even in the highly unlikely event of a loss of all offsite power, the diesel generators are not necessary for protection of public health and safety during conduct of the activities for which authorization is sought.

II.

The contentions now pending before this Board are not relevant to the activity sought to be authorized. To explain, there are only six contentions now pending before this Board which must be examined to determine whether such are relevant to the activity to be authorized and whether such present any reason to deny the authorization sought. These contentions are: Palmetto Alliance Contention 6 (Quality Assurance); Palmetto Alliance Contention 16 (Storage of Spent Fuel); Palmetto Alliance/CESG Contention 18/44 (Reactor Embrittlement); Palmetto Alliance/CESC Contention DES 17 (Adverse Meteorology); Palmetto Alliance/CESG Contention on the adequacy of the Catawba Diesel Generator crankshafts; and the Board's Contention on the adequacy of the Catawba Diesel Generators.*/

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*/ There are ten contentions dealing with emergency plans pending before another Licensing Board. However such do not affect the ability of this Board to make the requisite decision as the Commission has determined specifically that pending emergency plan contentions do not have to be resolved prior to fuel load and operation at power levels up to 5%. 10 CFR Part 50, App. E., Section I.

With respect to the four contentions which were the subject of the extensive evidentiary hearings in the fall of 1983, it is Applicants' belief that such are not relevant to this Motion. This is so because those issues are ripe for decision and a decision on them is expected before Applicants are scheduled to load fuel. Therefore, to avoid taking the Board's and parties time with these matters, they will be discussed only briefly.*/ Palmetto Alliance Contention 6 deals with quality assurance. The purpose of a quality assurance program is to assure the plant has been built safely so as to prevent accidents and/or mitigate the consequences of an accident. Because the supporting affidavits demonstrate clearly that in the unlikely event of an accident under the conditions sought to be authorized, there would be no adverse consequences, Contention 6 is irrelevant to the instant activity. Palmetto Alliance Contention 16 dealing with the storage of spent fuel from Oconee and McGuire at Catawba is irrelevant because during the activity sought to be authorized there will be no spent fuel from any source stored at Catawba. Palmetto Alliance/CESG Contention 18/44 dealing with reactor embrittlement is irrelevant because, as the record in this proceeding shows, such will occur, if at all, only after a prolonged period of neutron bombardment resulting from full power

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*/ Of course, should the Board desire more information on these contentions, or be unable to reach a decision on those issues before the fuel load date, or should such decisions be adverse to Applicants, Applicants reserve the right to amend this Motion to include a complete discussion of each of these contentions, with supporting affidavits if appropriate, to demonstrate more fully that each of these issues is not relevant to the authority sought.

operation. Consequently, this contention clearly is not relevant to the authority sought. Finally, Palmetto Alliance/CESG Contention DES 17 deals with the assessment of adverse meteorology in evaluating the consequences of severe accidents. Because the attached Affidavits demonstrate that in the unlikely event of an accident under the activities sought to be authorized, there will be no fission products released, this contention is not relevant to these activities. With respect to the diesel generators, Applicants' position, explained in detail below, is that for the activities sought, diesel generators are not necessary to satisfy the Commission's Regulations or to assure protection of the public health and safety.

III.

The facts supporting this motion are presented in the attached "Affidavit of P. M. Abraham and William R. McCollum, Jr." (Abraham/McCollum Affidavit) and "Affidavit of Charles J. Wylie" (Wylie Affidavit). Taken together, those affidavits (1) describe the activities which will be conducted under the authorization sought; (2) demonstrate that those activities will not pose a threat to the public health and safety even in the absence of the diesel generators; and (3) demonstrate that the reliability of the offsite AC power supplies is great enough so that it is extremely unlikely the diesel generators would be called on.

The sought authority is limited to operation which will produce no risk to the public health and safety. The reactor will not be brought critical, therefore there will be no fission

products or decay heat produced such as would follow criticality. Such fission products and decay heat are the critical elements in assessment of accident consequences. Thus even in the highly unlikely event an accident were to occur, there could be no adverse consequences. (Abraham/McCollum Affidavit, ¶¶ 16-17).

Initial fuel loading and the precritical testing for which authorization is sought are described in Chapter 14 of the FSAR and the attached Abraham/McCollum Affidavit (FSAR §14.2.10.1, Table 14.2.12-2; Abraham/McCollum Affidavit, ¶¶ 8-11). Briefly, though, during initial fuel loading 193 cold, clean (unirradiated) fuel assemblies and specified control components will be loaded into the reactor vessel, in accordance with a written, approved procedure, to form the reactor core.

An initial nucleus of eight fuel assemblies, the first of which contains an activated neutron source, will be loaded into the reactor vessel to permit meaningful inverse count-rate monitoring of additional fuel insertions. This initial nucleus is determined by calculation and previous experience to be markedly subcritical ($K_{eff} < .95$) under the required conditions of fuel loading. Each subsequent fuel addition will be accompanied by detailed neutron count rate monitoring to determine that the just-loaded fuel assembly does not excessively increase the count rate and that the extrapolated inverse neutron count rate is not decreasing for unexplained reasons. (Abraham/McCollum Affidavit, ¶ 8).

During core loading at least one path for boron addition to the Reactor Coolant System will be available at all times. Uniform boron concentration in the Reactor Coolant System will be maintained by circulation with at least one residual heat removal pump and is sufficient to assure K_{eff} less than or equal to 0.95 during fuel loading. Containment integrity will be established and maintained in accordance with the Technical Specifications. Upon completion of the fuel loading, the reactor upper internals and reactor vessel head will be installed, and precritical tests will performed. The precritical tests are data collections involving control rods, reactor coolant flow, incore instrument action, etc. and are performed with the reactor core in place but with a subcritical condition. (Abraham/McCollum Affidavit, ¶¶9-11)

This precritical testing will involve performing mechanical and electrical tests on the rod cluster control assembly drive mechanisms, to include an operational checkout of the mechanisms and of the individual rod position indicators. Tests are performed on the reactor trip circuits to test manual trip operation. At all times that the rod cluster control assembly drive mechanisms are being tested, the boron concentration in the reactor coolant is maintained such that criticality cannot be achieved with all rod cluster control assemblies fully withdrawn. The level of boron concentration will be closely monitored and checked to assure that it is maintained at the proper level.

Design reactor coolant flow is verified and flow coastdown times are measured to determine conformance with safety analysis. (Abraham/McCollum Affidavit, ¶¶ 10-11)

The Commission's conclusion that the risks to the public health and safety are extremely low for operation of a reactor with fuel loaded, but with no self-sustaining chain reaction present, is confirmed in the attached Abraham/McCollum Affidavit. As that Affidavit shows, the potential impact of a nuclear power plant on the public health and safety, whether appreciable or insignificant, is assessed in terms of the potential for accidents which could result in the release of significant quantities of radioactive fission products. In other words, the public health and safety risk associated with a nuclear power plant is characterized in terms of the likelihood of accidents involving plant systems which contain large quantities of radioactive fission products and the amount of fission products which are actually released as a result of such accidents. In a typical operating nuclear power plant fission products are contained in radwaste systems, spent fuel assemblies outside the reactor core, and the reactor core itself. Since the fission products are the byproducts of the fission process taking place in the reactor core, the inventory of radioactive fission products contained in these systems would vary from zero for a plant which has not attained initial criticality to an equilibrium value for a plant which has been in full power operation for a long period of time. In short, fuel loading and precritical test activities involve no sustained fission reactions in the facility, and therefore,

no fission products are generated at the facility. Consequently, these activities pose no adverse impact to the public health and safety. (Abraham/McCollum Affidavit, ¶¶12-13)

Examination of another aspect of the proposed activities demonstrates there is no adverse public health and safety implication. This is the amount of core decay heat available in the core after reactor shutdown following any postulated accident. The principal mechanism for significant release of fission products from the reactor core during postulated accidents is core damage from inadequate decay heat removal. The amount of core decay heat is a function of the power level and the duration of power operation. During the fuel loading and precritical test activities decay heat is nonexistent. Consequently these activities pose no potential impact to the public health and safety. (Abraham/McCollum Affidavit, ¶ 14)

Based upon the above discussion, it is clear that for the activities for which permission is sought, the Catawba diesel generators do not have to be available to satisfy the Commission's regulations or to protect the public health and safety. The necessity for diesel generators derives from General Design Criterion 17, which states in pertinent part:

> An onsite electric power system . . .shall be provided . . . to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

10 CFR Part 50, Appendix A.

To begin, it is highly unlikely that all offsite AC power will be lost. The Wylie Affidavit describes the high reliability provided by the numerous and diverse means of providing adequate offsite AC power to Catawba. Five 230kV double circuit lines from different locations integrate Catawba into the Duke Transmission Network; each of these 230KV double circuit lines has an average availability of .99457. Further, Duke has never experienced a total loss of power to a switchyard at one of its generating stations. In addition, a number of design features were incorporated into the normal auxiliary power system at Catawba to assure a high availability of offsite power to the essential buses. Thus, the reliability of Duke's Grid System, coupled with the design of the Auxiliary Power System assures a high availability of offsite power to the essential buses. (Wylie Affidavit, ¶¶9-12). However, even in the highly unlikely event offsite power were lost during fuel loading and precriticality testing the diesel generators would not be necessary. During such activities no emergency AC power is required to meet the requirements of GDC 17 because with no fission products and no decay heat, the considerations underlying GDC 17 do not come into play. (Abraham/McCollum Affidavit, ¶¶ 16-17)

This conclusion is confirmed by a review of FSAR Chapter 15's mandated safety analysis. During fuel load and precriticality testing most of the anticipated operational occurrences and postulated accidents covered in Chapter 15 simply could not occur or are not applicable because under the activities for which permission is sought the reactor is subcritical and there is no

heat generation in the core. And as the discussion above indicates, even those events which could occur would have no impact on the public health and safety because there will be no fission product inventory and no decay heat. (Abraham/McCollum Affidavit, ¶¶ 11-16)

IV.

The license Applicants seek with respect to fuel load and precriticality testing is identical to the license approval sought by, and recently authorized by the Commission for, the Diablo Canyon plant. As the Commission there noted:

> The risk to public health and safety from fuel loading and pre-criticality testing is extremely low since no self-sustaining nuclear chain reaction will take place under the terms of the license and therefore no radioactive fission products will be produced.

Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 & 2), CLI-83-27, 18 NRC ____, slip op. at 5 (Nov. 8, 1983). The Commission's conclusion that the risks are extremely low for conduct of the activities of fuel load and precritical testing is directly applicable in this instance.

Another point should be noted here, given Intervenors "commitment" to oppose this Motion; in Diablo Canyon the Commission was faced with a request for hearings concerning Pacific Gas and Electric's request to load fuel and conduct precriticality testing. Such request was denied by the Commission because it explicitly found no significant safety issues were presented:

> Since there are no significant safety issues material to fuel loading and pre-criticality testing, and there will be no prejudice to future Commission decisions, a consideration of the equities favors denial

> of the Joint Intervenors' request to defer the decision on the licensee's request for reinstatement and extension of the license to load fuel and conduct pre-criticality testing pending the holding of a hearing on the licensee's request. [Id. at p. 6.]

Therefore, Applicants maintain that the matters of a fuel load license and precritical testing can be decided by this Board on the basis of affidavits alone; no need exists for a "mini-hearing."

The rationale for the Commission's grant of a license to load fuel and conduct precritical testing at Diablo Canyon applies with even greater force with respect to Catawba. Quality assurance litigation calling into question many aspects of the Diablo Canyon design was ongoing at the time of the Commission's action. Catawba, however, now has a massive record compiled and pending before this Board on all safety issues, including quality assurance, except those concerning its existing diesel generators. Applicants anticipate that, by the time the schedule calls for loading of fuel, the Board will have issued its decision on those issues.*/ Since there is no requirement for diesels during fuel load and precritical testing the assurance of no risk to the public health and safety from these activities is even greater at Catawba than at Diablo Canyon.

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*/ However, in the event such decision does not precede Applicants' need to load fuel resolution of the subject contentions is not necessary for purposes of this motion as explained in Section II, supra.

WHEREFORE, for the reasons set forth above, Applicants respectfully request this Board to grant the instant motion and authorize the Director of Nuclear Reactor Regulation to issue to Applicants a license to permit loading of fuel and conduct of certain precritical testing at Catawba.

Respectfully Submitted

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