UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DUKE POWER COMPANY	)	
	)	
(Amendment to Materials License SNM-1773 for Oconee Nuclear Station Spent Fuel Transportation and Storage at McGuire Nuclear Station	)	Docket No. 70-2623

CESG'S PROPOSED ELEMENTS OF FACT AND CONCLUSIONS OF LAW
TOWARD AN INITIAL DECISION

Duke Power Company seeks authorization to ship 300 spent fuel assemblies from its operating Oconee station to its as yet unlicensed McGuire plant. This authorization is opposed by intervenors Carolina Environmental Study Group, CESG, and Natural Resources Defence Council, NRDC. It is supported by NRC staff. The background is summarized in Duke's proposed Initial Decision, filed May 19, 1980.

CESG will not presume to enunciate an "Initial Decision." It does profer a reading and interpretation of the record in regard to the issues.

CESG regards the role of government as responsive to the public interest. Government understanding of what is in the public interest has, historically, seen many changes. The public perception of the costs of nuclear power in relation to the benefits has changed materially as a result of the Three Mile Island experience. The NRC, as a consequence, has recognized inadequacies in the licensing and regulatory processes.

There is a growing recognition of the problems related to the isolation of nuclear wastes. The President, in a message to the Congress, Feb. 12, 1980, established a waste management policy and program, including the establishment of the State Planning Council

D503
S011

ADD: J. SHAFER 01
H BRISTOW 01

8006110246 C

He strongly and clearly enunciated the need for public participation, calling for

> . . .the public /to/ fully participate in waste decisions. . .
>
> . . ./for implementation to be/ open to continuous public view. . .
>
> . . .State consultation and concurrence in repository siting. . .
>
> . . .it is essential that all aspects of the waste management program be conducted with the fullest possible disclosure to and participation by the public and the technical community.
>
> . . ./a/ National Plan /which/. . .will give the public an opportunity to review the entirety of our program.
>
> . . ./proceeding steadily/. . .to resolve the remaining technical issues while ensuring full public participation and maintaining the full cooperation of all levels of government.

With this administrative guidance it is proper that the initial decision take cognizance of the limited appearances in this waste related matter. This will remedy deficiencies in staff performance, which appear to be in contravention of 10 CFR §0.235 (a) and (b). Staff has dealt with the current matter in two dimensions: an evaluation of alternatives in regard to public health and safety, and cost comparisons. It has not concerned itself with the local expressions of view, except for the applicant. This is an ill the Board can cure.

Twenty limited appearances were made by representatives of local government and individuals. Only one indivdual supported the proposed actions. The City of Charlotte and the County of Mecklenburg adopted, in 1979, resolutions opposing the transport of spent fuel on the applicant's preferred route through Charlotte. The resolutions favored alternates such as increased in-plant storage capacity or the use of an AFR in a region of lower population density. Lincoln County passed a resolution opposing the movement of spent nuclear fuel

or waste through that county (tr. 4711). Gaston County similarly passed a resolution opposing the movement by Duke of spent nuclear fuel through Gaston (tr. 4699). These actions by the elected representatives of three counties and a major city are a clear political expression which should be noticed in and reflected by the Initial Decision.

Of the fifteen individuals not acting in the capacity of representatives of local governments a number represented organizations: the League of Women Voters, the Central Piedmont Group of the Sierra Club (tr. 384); Carolina Action, the Safe Energy Alliance (tr. 699, 704); the Davidson Energy Group (4719). The common burden of these appearances was--don't transport the spent fuel, if it can be avoided, to other than a final repository. Don't take it through population centers. Do solve the waste problem expeditiously. The Mayor of Charlotte and the City Council joined in this expression in a filing for which the record was left open. Ms. Dykes (tr. 955) recommended that AFR's be built at sites for repositories so that spent fuel travel could be minimized. The limited appearances were well informed, the acts of intelligent and responsible citizens and should be weighed in the forming of the Initial Decision.

A complicating difficulty in licensing proceedings is that they are future directed. The findings are, of necessity, based on a mixture of facts, pertaining to material objects which exist or have existed and events involving such objects, and of projections, conjectures. It is a fact that obsolete fuel casks were subject to high speed impact tests and did not release content in those tests (Sandia 77-0270, Sandia 77-1462c). It is a fact that the design and dimensions of the Sandia tested casks and the NFS-4 of applicant differ (App. Ex. 21).

It is a fact that the NFS-4 casks have not been subject to any physical tests, including those of 10 CFR §70 Appendix A. It was determined analytically that the cask design was adequate to pass the test and meet Certificate No. 6698 requirements (tr. 1299). The capacity of the NFS-4 cask to meet these requirements is a matter of engineering conjecture, however reasonable. The conclusion by staff that there will be ". . .no significant environmental impact attributable to the proposed action " (Staff Ex. 5, 65) is based on a series of conjectures which assume the maximum accident to which the cask will be exposed and the positions of persons in that postulated event (Staff Ex. 5, 6.1.4). Based on experience to this point with the reliability of engineering conjecture and actual experience in transporting casks, it appears quite likely that if the proposed action is taken that no cask will be damaged to the point of causing release and that the quality of the human environment will not be significantly affected. And though human actions are reasonably predicated on such a basis, the fact remains that this conclusion is still conjecture. Intervenor has pointed out the invariable practice of staff counsel to refer to conjecture as fact (CESG Response to Staff's Motion for Summary Disposition, June 7, 1979). This consideration, we urge, be kept in mind by the Board in judging the weight to be given staff estimates of consequences, wherein the circumstances chosen determine the dosages calculated. In the case of the most serious accident considered in the EIA the "maximum individual" is 100 m from the accident scene. Where is the driver? Where is the crew or the possible escort? Where are emergency response people, police, wreckers, firemen? Are these not individuals? Is it not a more reasonable conjecture that they will be closer than

100 m, closer than 10 m, perhaps even closer than 1 m?

There is no dispute that the source term for ^{85}Kr alone is 1700 curies for 100% fuel pin perforation (Staff Ex. 3, Table A-9, .37). There clearly is a large potential for radiation dosage in a single 270 day aged, spent fuel assembly. It is a reasonable conjecture that the less cumulative time this material is on the road, the fewer the transfers made, the lower the population density along the route, the less heavily traveled the road, and in regard to accident seriousness, the slower the speed, the less the likelihood of significant dosage. Although in-plant accidents and releases may occur, those alternatives which are consistent with minimum out-of-plant transit are most likely to make for minimum dosage of the public and most likely to be responsive to the concerns expressed by the public.

CESG contends that fuel shipment is unacceptable compared to other alternatives. / CESG's contention 1 (a) calls for modification of the existing Oconee fuel pools to provide additional storage capacity. Fuel pool 3 appears to be the best candidate for such consideration. Favorable considerations for this choice and the availability of materials were advanced by CESG (CESG Ex. 5, 3). A staff engineering witness while noting problems associated with such a pool expansion acknowledged that the age of the fuel would be a factor as to the adequacy of the existing pool cooling system, stated that no unusual problems would be encountered in having the bridge crane make a 90 degree change in direction, and confirmed the existence and use of corrugated stainless steel diaphragms as a means of connecting structures subject to some degree of motion as in a seismic event (tr. 3665-9).

In contention 1 (b) CESG advocated the construction of a new and separate fuel storage facility at the Oconee site.

Both fuel pool extension and the construction of an ISFSF require substantial periods of time, conceivably as much as five years. In this time there was the question of what to do with Oconee spent fuel if transport to an interim storage site were unacceptable. This could be accomplished by increasing the packing density by the use of high density racks or poison racks, both of which are present art. Applicant indeed had initially racked pool 3 with H.D. racks as the prospects for reprocessing and AFR's dimmed. Applicant indeed proceeded with plans to place H.D. racks in pool 1/2 so as not to be constrained by a Dec. 1979 point of no return. Even so, applicant during the 1979 proceedings could not see providing Oconee capacity with full core reserve past May, 1983. Applicant has since improved on this position by acting on CESG's observation

> A combination of available high density racks in reracking fuel pool 1-2 with poison racks as soon as available would significantly extend the period of Applicant's FCR capability prior to the completion of the ISFSF extension to fuel pool 3.

By this means Oconee will ". . .maintain the capabilty of discharging one full core into the combined capacities of the two onsite pools through late 1986"(Duke Ex. 30, 2). This clearly makes it possible, timewise, for applicant to either extend pool 3 or to build an onsite ISFSF.

Despite this extension of storage capability, applicant still seeks authorization to ship 300 spent fuel assemblies to McGuire (Duke Ex. 30, 2,3; Staff Ex. 36, 4,5, app. chart). It is asserted that such shipments are essential for applicant to be able to poison rerack pool 3 (tr. 3480-82). This is predicated on moving 25 assemblies per month to McGuire except during refueling periods. Depending on the number of assemblies transferred from pool 3 to pool 1/2, poison racks could be operational in pool 3 by June, 1983 or June, 1984

(Staff Ex. 36, app. chart, Options B and C). It is applicant's position that to empty pool 3 preparatory to poison racking, which it states is a requirement though it is clear that poison racks will replace H.D. racks in pool 1/2 without it being emptied, and to not ship to McGuire an impossible situation will result (Duke Ex. 31). Transfers from pool 3 to pool 1/2 can be made at no more than 25 a month, and then only when there is no refueling activity. Before pool 3 could be emptied, pool 1/2 would be filled to its capacity of 1312. The date would be Nov., 1984. There would still be 69 assemblies in pool 3, and 72 would be added by a May, 1985 refueling. The turn-around time is taken as 24 hours, the same as for shipment to McGuire. The record shows these numbers are not firm. At one point applicant testified that the onsite time for cask loading or unloading was 12 hours.(tr. 792). The transit time, round trip, Oconee to McGuire, was given as 8 hours. Therefore cask loading and unloading must be done in 8 hours or less (tr. 4754). Applicant was very uncertain as to how long loading/unloading turn around actually takes (tr. 4753, 4756, 4758, 4781-83).

The 8 hour loading time to which applicant testified (tr. 4754) would, given a 25 workday month, make possible 37 cycles of 16 hours. A cycle time of 12 hours would make possible 50 transfers in a 25 workday month. At this transfer rate, pool 3 assemblies could all be placed in pool 1/2 by January, 1983, giving applicant more than enough time to poison rerack pool 3. Even the 16 hour load/unload cycle operated 30 days a month would make possible 45 transfers per month. The installation by mid 1983 of poison racks in pool 3 would make possible operation until about 1990 of Oconee without outside shipments. There is a reasonable expectation that by this date the repository program would be well underway and that DOE repositories

would be available for such interim storage as might be required. By this means which, though not foreseen in the earlier part of the proceeding, the applicant would be able to maintain full core reserve until about 1990 and the public would not be exposed to any of the uncertainties in regard to spent fuel shipment. If for any reason the National Plan for repositories or AFR's became bogged down, applicant would have lead time through 1985 to build an ISFSF.

CESG's contention 2 asserts that the proposed action will create an unacceptable hazard:

(1) by significantly increasing the radiation doses to persons living near the transportation route;

(2) by significantly increasing the radiation doses to persons travelling on the transportation route; and

(3) due to accidents or delays in transit.

It is medically accepted that there is a relation between health effects and radiation exposure. Staff has calculated dosages to cask truck drivers and to the public (staff Ex. 3, 5.3). The estimated dose to drivers for 300 trips is 16 man rem, distributed over several individuals. Staff does not state that this is a non-significant dose. It is the equivalent of forty years exposure to four persons at the locally prevailing natural radiation level of 100 mrem per year. Although response to dose apparently differs with the individual, the normal life time dosage of natural radiation is recognized as a factor in cancer incidence.

Staff calculates that cumulative doses to the public would be small (staff Ex. 3, 5.3.2). The largest dose was attributed to people approaching the truck at stops and was 3.9 man rem. Viewed in the context of the preceding paragraph, this is not negligible. The dose

to the maximum individual along the route was calculated as 0.02 mrem; that to persons exposed in a 3 hour traffic jam was calculated as less than 0.2 man-rem and the maximum individual as 15 mrem. The dose to a passenger in a car tail-gating the truck for four hours was calculated as 0.36 mrem per shipment, 110 mrem for 300 shipments. These figures are the apparent basis for the conclusion that the quality of the human environment will not be significantly affected. The consideration of alternate routes resulted in an upward revision of total transit dosage from 0.22 man rem to 0.47 (staff Ex. 37), small in relation to the onlooker and driver doses.

The calculated dosage values depend on source term, exposure time (route mileage and speed plus stops), and the location and number of persons in relation to the source. For example, the car following the truck is assumed to be 100 feet behind it. If the assumed distance is changed to 10 feet, which in terms of experience is not unusual, the dose calculated increases 100 fold from 0.36 mrem per occupant per exposure to 36 mrem. By putting four occupants in the car, the dose is increased to 144 mrem. If this event occurred in only one third of the trips, the cumulative dose would bt 14.4 man rem. If the traffic tieup case is calculated with assumptions conducing to a maximum dose, the total for forty exposed indivdiuals calculates out to 3 man rem (CESG Ex. 5, 9). Calculations along the route assume the maximum individual at 30 m. A witness familiar with the route testified that there are places of business along interstate 85 which are materially closer and similarly habitations along secondary roads (tr. 2411, 2393). A consistent application of more realistic worst case distances would increase doses about one hundred-fold to about 20-50 man rem. When truck driver and onlooker doses are added in, it is not so supportable to maintain that the quality of the

human environment will not be significantly affected. There should be some tangible offsetting benefit to the public if the environment will deteriorate to this extent. Given the clear possibility of keeping the fuel at Oconee until about 1990 without having to transport it, this exposure does not seem permissible.

The accidental exposure potential has been considered by staff (staff Ex. 3, 6.0), and by applicant (Duke Ex. 9, Ex. 22, Ex. 25). As for routine exposures, the assumptions re distance and number of individuals diminish the calculated effect. The underlying assumption, also made by applicant, is that the probability of severe accidents is less than for minor ones. The DC-10 in Chicago in May, 1979, does not support this thesis, nor do other unusually severe accidents. There is no documentation of an empirical nature to support EIA Table 6-1. This matter is even more conjectural than the routine exposure matter. Consider the assumptions. In the case of undetected gaseous leakage from the cask, the maximum individual is 100 m downwind. At a truckstop it would be likely that all individuals would be closer than 100 m. (staff Ex. 3, 6.1.1) In the case of a lost neutron shield the member of the public is 10 m from the cask. If the leak occurred enroute to a truck stop, and were not detected, maximum individuals could approach within 1 m of the cask (ibid. 6.1.2). In the cask overpressurization case, due to collision and fire, the maximum individual is assumed to be 100 m from the cask. As previously queried, where are the crew, the emergency response people? It would seem reasonable to increase total dose in this case by a factor of at least ten thousand to allow for distances down to 1 m and of the order of 10 persons so exposed (staff Ex. 3, 6.1.3, Table 6-2). Similar considerations apply to the extra severe accident (ibid. 6.1.4, Table 6-3). Again the maximum individual is 100m; a group of people is 400 m.

Even for the minimizing assumptions made, bone dose commitments as high as 13,000 man rem are calculated for a university student body and of 11,000 man-rem--for the maximum individual at 100 m (ibid. Table 6-3). This evidence, although somewhat muting what would emerge with more realistic worst case assumptions, makes clear the enormous potential for damage of a single spent fuel assembly. A very low speculative probability for the event is not real assurance that it cannot occur. Avoidance of the 300 proposed shipments is a reliable means of assuring that such events cannot occur. Is the proposed benefit worth any risk? What, indeed is the proposed benefit? Reracking fuel pool 3 by the schedule that applicant at the moment envisages.

Applicant's witness for risk in transportation has a similar set of results. Again the theory is relied on that the more severe the accident, the less likely (Duke Ex. 9, 2-4). The route traffic density was assumed; the high density of population near the road was ignored (a gradient was not used) although it was agreed the gradient would exist; contamination of existing water supplies by releases into specific crossings was not considered; there was uncertainty as to whether coolant release from a turned over cask was taken into account in a fire scenario; the performance of the NFS-4 was based entirely on analysis; no special consideration was given to the very high incidence of tractor trailer turnovers at the junction of I-85 with I-77, or of the role that icing of the overpass at this intersection could play; heavy I-77 traffic in petroleum product tank trucks was not an add-on item in the study; there is no settled state-of-the-art in risk analysis; accident probability is high both initially and finally in terms of equipment performance;

(Duke Ex. 22; tr. 2729).

The Board, in the interest of pursuing a matter related to public health and safety, admitted an amendment to CESG's contention 2:

> With respect to case three of the cask drop analysis of Applicant's FSAR 9.1.2.3.2, submitted involving a postulated cask drop accident at the spent fuel pool, the Applicant's analysis and Staff's review are inadequate. Case three involves tipping or dropping and tipping the cask, located above the floor or in contact with the floor level of the pit wall opposite the fuel pool side. (Tr. 4181)

Staff's witnesses testified that applicant did not, in response to request, provide sufficient information for staff to make an independent analysis of case three in regard to cask drop into the fuel pool. The administrative control proposed by applicant will not prevent cask drop (tr. 4222-3). The only barrier to keep the cask from reaching a critical location is visual (tr. 4231-3). Operator failure, disablement, or intentional deviation were not given consideration by staff (tr. 4240). If cask did fall into fuel pool, staff did not calculate the possibility of criticality (tr. 4260).

> Well, we tried to prevent the fuel pool be (sic) critical by preventing the cask going over into the spent fuel pool. That's the only way to prevent spent fuel being damaged and become (sic) critical.

A weir gate weighing 4200 pounds, 8.4% of the cask weight, was calculated by staff to produce significant radiological consequences by dropping on Oconee spent fuel in the McGuire fuel pool (tr. 4268-9), FSAR Table 15.5-5.

CESG testified (CESG Ex. 13, tr. 4462-) a potential energy analysis would indicate whether there was any possibility for the cask to drop into the pool. In the initial position least favoring gyration into the pool, about 60% of the potential energy would have to be absorbed to prevent the drop. CESG, after confirming the drop with crude models, built a dimensionally accurate model, with the

exception of a collapsible neutron shield and found that it gyrated into the pool. A demonstration from the least favorable initial position was witnessed by staff and applicant (CESG Ex. 15, tr. circa 4870). The fall across the fuel pool wall was recorded on videotape. This demonstration confirms CESG testimony (tr. 4462-) that the situation is sufficiently complex that a model provides better guidance than an analysis which ignores significant factors or makes inaccurate assumptions. The Sandia Laboratory study relating model performance to full scale cask performance in impact situations found that the model corresponded in performance to the actual cask.

The criticality aspects of a cask drop were addressed by both staff and applicant (staff Ex. 40, Ex. 41, Ex. 42; Duke Ex. 33). Staff testified on the relation of k_{eff} and k_{inf}, measures of criticality, to the water thicknes between fuel assembly flats, assembly separation in a rack crushing situation, fuel degree of burnup, and boron concentration in pool water (staff Ex. 40, Ex. 41). Applicant made a similar study (Duke Ex. 33). A reactor operates at just under a k_{eff} of 1.00000 (tr. 5). k_{eff} increases about 0.01 for each decrease of 100 ppm of boron (staff Ex. 40, Fig. 1). For any of the fuels which may be stored in the McGuire fuel pool, at an assembly separation of 0.5 inches, criticality will result if the boron content of the water is lowered. A reduction from 2000 ppm to 1500 ppm would be sufficient to cause criticality (tr. Apr. 28, Marotta in cross exam. (this tr. not available)). Both Oconee and McGuire fresh fuel require more than 2000 ppm boron to avoid criticality at 0.5 inch assembly separation (staff Ex. 40, Fig. 1 and 2). Applicant calculates a k_{eff} of 0.95 for Oconee spent fuel (Duke Ex. 33, 6) corresponding to staff's calculation of 0.92 (tr. 5074-5). The minimum specification of boron for the pool is 2000 ppm (tr. 5082). Oconee has a similar one

and at this time has not fallen below it (tr. 5092). Fresh McGuire fuel at a separation of assemblies of 0.5 inch would require about 3000 ppm boron to provide a reasonable safeguard against criticality (staff Ex. 40, Fig. 2).

Uniform spacing of the fuel pins in the assembly lattice is a factor in maximizing k_{eff} (Marotta, cross, Apr. 28). Assemblies receiving the direct impact of the cask may be disarranged and have a k_{eff} as low as 0.45 (Duke Ex. 33, 6). However assemblies pushed together by secondary effects of the cask drop would not be thus damaged. A criticality event with such casks at a boron level of 1500 ppm is credible.

To reduce tne boron level from 2000 ppm, dilution is required (tr. 5084). The fuel pool holds 400,000 gal. The containment storage tank holds 350,000 gal (tr. 5085-7). The two interconnect (tr. 5088). Boron dilution incidents have already occurred in which the limiting technical specification was exceeded (U.S.NRC, Power Reactor Events, Vol. 1, No. 3/July, 1979, pp. 5,6). A level of 1198 ppm was reached during a reactor coolant system fill, as opposed to an expected level of 1246 ppm.

> The event was caused by a combination of mechanical, personnel and procedural errors.

The inadvertent addition of 3000 gal of demineralized (boron free) water was the cause. At any time containment fill is made up there is the possibility of inadvertent dilution.

Another cause for makeup and potential dilution is leakage from pipes in the borated water system. Intergranular stress corrosion cracking has been observed at Three Mile Island-1, Surry, Arkansas-1, and is the subject of Board interest at Zion (Board Notification 79-33, attachments). Given the foregoing causes for makeup and possible

dilution of borated water, it would be prudent to make cask drop into the pool a physical impossibility by requiring an appropriate barrier.

Staff testimony takes up the criticality question for the first McGuire core, if stored in the pool (staff Ex. 41). The maximum enrichment is 3.1 percent, the average for the whole core is 2.6 percent. Burnable poison rods will reduce the reactivity about 5.5 percent when it is in the cold condition. At a pool concentration of 2000 ppm boron, k_{eff} was calculated as a maximum of 0.98, using a 2 percent uncertainty factor. If the deficiency in boron concentration exceeds 200 ppm, a criticality incident would be possible. The question of a more enriched second core, the maximum permissible ^{235}U concentration is 3.5 percent, was considered elsewhere (staff Ex. 40, Fig. 2) in which it was calculated that more than 2000 ppm of boron would be required to keep k_{eff} less than 1.0000. At 3000 ppm k_{eff} was 0.96.

Matters of cask security and safeguards against sabotage have run a complex course since Duke made application for a license to transport fuel assemblies from Oconee to McGuire. CESG had been given standing in this matter before the Federal Register announcement because it had raised related questions in the operating license proceeding to which it was a party. Contentions re sabotage were unacceptable to staff and to applicant at the time of first consideration. Neither staff nor applicant would stipulate to matters which fell outside the ambit of the regulations. As a consequence of Sandia Laboratories interim report, SAND 77-1927, Chap. 6, the Commission issued SECY-79-278, followed by NUREG-0561, by 10 CFR §73.37, and, finally, by SECY-80-166. In the course of these actions the I-85/I-77 route through Charlotte was acceptable, was unacceptable, and now is

conditionally acceptable. The Board expressed strong interest in the sabotage question (tr. 312-22). The strong expressions of concern from local government and citizens certainly reflect concern about large releases--although not necessarily releases as a result of sabotage. (tr. 325)

SAND 77-1927 indicates means by which a cask could be sabotaged. The means discussed involve the use of high explosives or projectiles. These are available without much difficulty. The key question is, are there any persons who would choose to make use of them? Based on local experience and the political climate, it would seem unlikely. However the terrorist approach continues to increase in prevalence. It would be chancy to attempt a firm prediction as to what may happen during the period in which transport might take place. Again the principle would seem to apply--if it isn't necessary don't do it.

High explosives are not a requisite to cask sabotage. It's only what Sandia people happened to try. In the course of the hearing CESG has pointed out alternative simple means and confirmed the efficacy of these means by expert testimony. Procedures for acts of sabotage requiring only commonly available tools were detailed in a CESG filing (Intervenor CESG's Responseto NRC Staff's Motion For Summary Disposition in the Form of the Testimony of Jesse L. Riley, June 7, 1979; tr. 331). NRDC also considered sabotage an issue (tr. 343-7).

The simplest act of sabotage is to release the potentially radioactive water surrounding the spent fuel assembly. The propulsive force for discharge is the vapor pressure of the water which is heated by the spent fuel. The closures are removable, finger tight, requiring only a special tool for removal. The expanded metal cage around the cask is not a security measure, simply a means of

preventing injurious contact with the hot cask surface (tr. 1289, 1292, 1293, 1294, 1353). The tightening characteristics of the cover bolts, 1000 foot pounds, clearly make it possible for several men with a long handled wrench to loosen the six bolts (staff Ex. 29, NRC Certificate of Compliance No. 6698, CESG Ex. 5). There was testimony by applicant that the 1400 pound cask cover could not be handled by men without a crane for the cask in a horizontal position. This overlooks the general availability of jacks, such as used to change automobile tires, which will support more than 1400 pounds. It also underestimates the mechanical skills and ingenuity of persons generally. The chances are good that any group which succeeded in hijacking a cask would, if so intent, be able to remove the cask lid. Fully exposing the core would require no more than attaching a grapple and anchored cable to the inner basket and driving off. The assembly would be pulled from the cask and drop to the road. Under the proposed license conditions the assembly is a source of up to 1.5 million curies. Depending on circumstances, much damage could be done. There is no question that such an intact assembly could be returned to a cask by the use of available remote handling equipment (tr. 3862 et seq., 3911 et seq., 3953 et seq.). A well informed opponent could readily counter this returnability. It would only be necessary to remove the cask lid and, from a safe distance, fire an explosive projectile, such as a tank destroyer, into the open end of the cask. The assembly would in all likelihood be well dispersed. It would not be necessary to do this in a city. A deserted spot upwind of the city would suffice for such a purpose. The Board may wish to officially notice the correspondence between Sandia, the ACRS, and the NRC of Dr. Leonard Solon, Director, City of New York Bureau for Radiation Control (SECY-78-311, Enc. B, Minogue, Jan. 31, 1978).

SECY-80-186, March 28, 1980, sought approval for amendments to 10 CFR Part 73 in final form. Expedited approval was sought so that, presumably, the instant hearing, reconvening on April 28, 1980, would have it for guidance (ibid. p. 5). The Commission gave such approval April 23rd. Staff counsel distributed to the Board and the parties, on April 28th, the Affidavit of Donald J. Kasun (tr. 4921). Staff counsel wanted to "give the Court a copy of that decision", ALAB-580 (tr. 4922). The Kasun affidavit was marked Exhibit 39 for identification (tr. 4925). CESG expressed an interest in examining Mr. Kasun, Section Leader in the Division of Safeguards. Mr. Kasun was not offered as a witness. Exhibit 39 was not moved as staff evidence.

Considering the strong public interest shown in the matter of spent fuel transport which offers the potential for both accidents and sabotage, considering the objection of local officials when it first seemed that spent fuel would move through Charlotte, and of the officials of Gaston and Lincoln counties when it appeared, instead, that the spent fuel would pass their way, it appears that staff failed in its responsibilities to the public by not facilitating the development of this issue. The Board may, after its strong initial expression of interest in this matter, sua sponte determine to reopen the record in the matter of sabotage. Applicant cannot be counted on to so move. Applicant's Further Supplemental Testimony of Lionel Lewis, served on the Board and the parties April 14, 1980, deals with the recently scaled down estimates of early fatalities, morbidities, based on a single assembly rather than three. Depending on actual releases, upper bounds, because Charlotte is less densely populated than the Sandia model, would be less than 61 early fatalities, less than 1600 early morbidities and less than 1200 latent cancer fatalities (SAND 77-1927, Table 7, Case 1). Applicant did not offer this exhibit.

CONCLUSIONS

The following conclusions are commended to the Board based on the reading of the record:

1. Poison fuel reracking of pool 1/2, which the applicant intends to pursue, is feasible. It will make possible a full core reserve until late 1986.
2. Poison fuel reracking of pool 3 is feasible. With a realistic, although accelerated, intraplant spent fuel transfer schedule, it can be commenced, on an empty pool basis, so as to be operational in time to make unnecessary any out of plant shipment until late 1989.
3. Measures 1 and 2, foregoing, will provide applicant with abundant lead time if developments are such as to favor construction at Oconee of an independent spent fuel storage facility.
4. Measure 1 and intraplant transfer of all spent fuel to pool 1/2 will make possible the physical expansion of pool 3 to be equivalent to the addition of an independent fuel storage facility at a substantially lower cost in an acceptable time frame.
5. The consistent use by staff of numbers of persons and distances in calculating worst case exposures has resulted in a significant understatement of probable dosage in routine transport.
6. The practice by staff of 5, foregoing, combined with the theory that very severe accidents are very much less probable than smaller ones, and the failure to

consider the most severe, credible scenarios, has resulted in a very significant understatement of the potential injury to public safety and health inherent in spent fuel transport.

7. Staff and applicant have failed to make a record as regards the potential injury to public health and safety of a range of acts of sabotage.

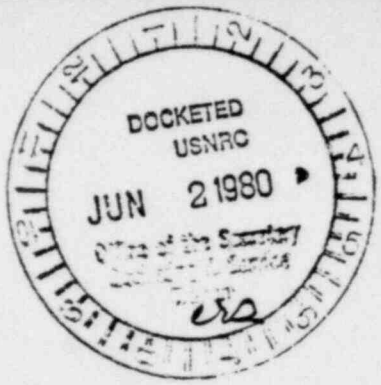
8. The deficiencies in the record with respect to the potential for injury to the public health and safety call for the issuance of an environmental impact statement for this major federal action.

9. The uncertainties in applicant's cask drop analysis, case 3, and the possibility of placing fresh, 3.5 % enrichment fuel in the same pool, combine to generate a possibility of criticality. Even in the case of spent Oconee fuel, a deficiency in pool boron of 0.05% would permit criticality in the event of a cask drop. Applicant shall be required to place a barrier over the cask pit/fuel pool wall such that it will be a physical impossibility for the cask to fall in the pool.

Respectfully submitted,

Jesse L. Riley
for the Carolina Environmental
Study Group

Charltte, N.C.
May 28, 1979



UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
DUKE POWER COMPANY	)	Docket No. 70-2623
	)	
(Amendment to Materials License SNM-1773 for Oconee Nuclear Station Spent Fuel Transportation and Storage at McGuire Nuclear Station)	)	

AFFIRMATION OF SERVICE

I hereby affirm that copies of "CESG'S PROPOSED ELEMENTS OF FACT AND CONCLUSIONS OF LAW TOWARD AN INITIAL DECISION", dated May 29, 1980, in the above captioned matter, have been served on the following by deposit in the United States mail, first class, this 29th day of May, 1980:

Marshall Miller, Esq.
Chairman
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dr. Cadet H. Hand, Jr.
Director
Bodega Marine Laboratory
University of California
P.O. Box 247
Bodega Bay, California 94923

Dr. Emmeth A. Luebke
Atomic Safety and Licensing Board
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

J. Michael McGarry, III, Esq.
Debevoise and Liberman
1200 Seventeenth Street, N.W.
Washington, D.C. 200036

Edward G. Ketchen, Esq.
Counsel for NRC Regulatory Staff
Office of the Executive Legal Director
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Richard P. Wilson, Esq.
Assistant Attorney General
State of South Carolina
2600 Bull Street
Columbia, South Carolina 29201

David S. Fleischaker, Esq.
Natural Resources Defense Council
1735 Eye Street, N.W., Suite 709
Washington, D.C. 20006

William Larry Porter, Esq.
Associate General Counsel
Duke Power Company
P.O. Box 33189
Charlotte, North Carolina 28242

Chairman, Atomic Safety and
Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Chairman, Atomic Safety and
Licensing Board Panel
U.S. Nuclear Regulatory
Commission
Washington, D.C. 20555

Mr. Chase R. Stephens
Docketing and Service Section
Office of the Secretary
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Jesse L. Riley