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OFFICE OF SECRETARY
PLANNING & SERVICE
BRANCH

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

Glenn O. Bright
Dr. James H. Carpenter
James L. Kelley, Chairman

In the Matter of

CAROLINA POWER AND LIGHT CO. et al.
(Shearon Harris Nuclear Power Plant,
Units 1 and 2)

Dockets 50-400 OL
50-401 OL

ASLBP No. 82-468-01 O.L.

Wells Eddleman's Revised, Amended and Additional
Contentions Based on Eddleman 15 and ER Amdt. 5

Pursuant to Item II.B of the Board's Order served January 12, 1983, Wells Eddleman hereby files the ensuing revisions of Eddleman 15, which may be seen as amendments to Eddleman 15. While Applicants continue to state a 70% capacity factor for both Harris units in their ER Amendment 5, and thus Eddleman 15 appears to me still valid to that extent, it appears from the Board's Order at p.3 that I must either stand on the original contention or submit revisions and amendments to it. If that is the case, the ensuing are the contentions I wish considered and ruled on under that Order. If not, I would request that original Eddleman 15 be considered again as well as the ensuing revisions and amendments.

I think it is obvious why these revisions or amendments or both could not be put forward until ER Amendment (AMDT) 5 was filed. Until then, Applicants had not asserted either a method for, or a value of fuel savings for Harris plant operation, nor a method of computing costs and benefits under the Commission's new need

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for power rule. While I might have been able to guess that Applicants would do this in various defective ways, it would not be reasonable to expect me to have predicted these errors and inconsistencies sufficiently specifically that they would have applied to an amendment Applicants constructed after receiving my original contentions some 6 months earlier. The Board has evidently recognized as much in deferring contentions and in quoting my statement on the difficulties of such an approach in its September Order admitting contentions. Highly specific clairvoyance as to errors Applicants might make in a future document, which is then served to Applicants as a contention, after which they still make the same errors foreseen, is just

too much to ask of an intervenor. To the extent these contentions allege errors in the ER AMDT 5 analysis and data, they are thus unable

Inasmuch as any of the following contentions may be viewed as late-filed since it is now more than 30 days since Applicants served excerpts of ER Amendment 5 on intervenors, I also show the following: My reading of the Board's January 11 Order is that such contentions may be filed now; further, I have been under unusual workloads in matters not related to this docket, both in consulting and in teaching and energy work under the auspices of Friends School, during this period, and it is now only about 45 days since I actually received Applicants' excerptson 12-26-82. These contentions below do not broaden the issues, for both capacity factor and cost-benefit analysis of Harris are already at issue. Taking them up now will not tend to delay this proceeding, since this is the same time that those issues as they relate to ER Amendment 5 are being considered. There are no other means to protect my interest in this matter, unless CHANGE were to file the same contentions. I have no knowledge of whether or even if CHANGE/ELP is going to file anything on these

*to be
filed before
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Amendment
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available.*

matters, and have not discussed this question with CHANGE/ELP. Staff and Applicants have shown no interest in advancing the view that Applicants' capacity factor and operating cost-benefit estimates are in doubt, or wrong, and the matter cannot be litigated without a contention. I doubt the Board would be allowed to take up this matter ex parte under the decisions NRC has been handing down, e.g. in V.C. Summer. Thus there are no other means to protect my interests concerning these issues. And the existing parties have not, except for CHANGE/ELP, taken up this issue at all. CHANGE/ELP's formulation was deferred, whereas part of mine has been admitted, so I believe that the extent CHANGE/ELP may be able to represent my interests in this question-area are limited and possibly nil if their deferred formulation or a revision of it is not subsequently admitted. Of course, there can be no assurance now that a CHANGE/ELP contention in these matters would be admitted.

Finally, as a party pro se to NC Utilities Commission Docket No. E-100 sub 41 hearings on avoided costs (essentially a fuel savings determination combined with other determinations under the Public Utility Regulatory Policies Act) in December 1982, I have demonstrated ability to assist in developing a sound record on the issues of capacity factor and possible fuel savings. The Examiner therein noted (Transcript Vol. II, p.107) that I had asked "relevant, clear questions" and later commended the attorneys and me "for taking about an hour and a half to get through a very complex witness, and it shows it can be done if everybody tries to get to the point (Vol IV, p. 134). I also have the ability and I testified as an expert on the E-100 sub 41 case in December. to analyze and question cost-benefit analyses. These facts demonstrate that the admission of these contentions would assist in developing a sound record in this docket before the NRC.

CONTENTIONS

15 X CP&L hasn't properly included working capital costs associated with fuel inventories for both coal and nuclear plants in its analysis of Harris projected fuel "savings". Specifically, the carrying cost and working capital associated with nuclear fuel in progress have been higher for CP&L's 3 nuclear plants (2245 MWe) (8 to 14 TWH annual generation) than the carrying cost and working capital required for all CP&L coal units (nearly 5000 MWe, 17 to 22 TWH annual generation) in recent years. Harris nuclear fuel is expected to cost more than fuel for CP&L's existing nuclear plants has cost due to the ending of low-cost uranium supply contracts. (Improper estimation of fuel escalation rates is the subject of Contention 22, but provides additional basis for this contention, as the cost of fuels -- and of nuclear fuel fabrication, enrichment etc -- relates to the cost of fuel inventory and working capital therefor, and indeed determines it on a long-term basis.)

ADDITIONAL BASIS: Testimony by CP&L witness G. Wayne King (Tr Vol. II, pp 100-103 especially at 102) in NCUC Docket No. E-100 sub 41 shows that CP&L considers the cost of fuel inventory saved to be part of the cost avoided by not running a plant. See also prefiled testimony of King, at p.4, and Exhibit 1, same Docket. The analogy with nuclear fuel carrying costs is clear considering the nearly \$100 million in nuclear fuel-in-progress requested by CP&L in rate base in its last NCUC general rate cases, e.g. Docket E-2 sub 444 and E-2 sub 416 (CP&L may have filed a new case in '83).

The increased enrichment cost from the new centrifuge enrichment facility at Portsmouth Ohio will also act to raise the cost of nuclear-fuel-in-progress, and lower-than-estimated nuclear capacity factors tend to pile up nuclear fuel material in the milling/conversion/enrichment/fabrication pipeline, further raising nuclear fuel working capital costs since the fuel is held longer before it is used.

15 Y CP&L has improperly compared gross "benefits" (fuel savings) to the CP&L system with the environmental effects of Harris operation, neglecting the costs associated with that operation. The proper comparison would be the net (benefits less cost) of Harris operation, as compared with the environmental effects of the plant's operation.

BASIS: CP&L states (ER Amdt 5, p. 8.1.1, next-to-last paragraph) that it has considered fuel savings on their system as the only comparison to environmental costs. CP&L further admits (last paragraph, same page) that comparison with production cost savings is proper. However, CP&L's ER AMDT 5 "analysis" omits, for example, the Harris operating payroll, which is a cost incurred to receive any "fuel savings". It omits variable O&M equipment, materials and supplies costs (in addition to labor), and contractor O&M and repair such as contract labor, and materials & supplies & engineering for repairs costs, which will have to be paid to keep Harris in operation. It omits the cost of environmental monitoring, emergency planning, and personnel on and off the Harris site to perform these acts for CP&L and for other responsible parties, e.g. State of North Carolina, and counties and municipalities which include areas within 10 miles of Harris. CP&L omits any consideration of the (probabilistically weighted or other) costs of serious accidents at Harris, which is an effect "unintentional or unplanned" under NEPA. CP&L omits the cost of additional support personnel at its headquarters and other places, who will be required due to having more (i.e. Harris) nuclear plants. These costs of non-plant support personnel are included in rate cases by the company, and should not be excluded here. CP&L further omits the avoidable costs of certain transmission, transformer and other facilities which would not be required if Harris 2 is not built. Such avoidable costs are recognized under the Public Utility Regulatory Policies Act. All of these costs which CP&L has omitted will only occur if the Harris plant operates.

15A The ^{Harris} capacity factor (70%) and contribution to capacity (1800 MW) of ER Amendment 5, section 8.1.1-1, are too high. ^{BASIS} (1) Since the NC Utilities Commission has found a 20% reserve margin appropriate for CP&L, only 1500 MW of firm capacity would be reflected in the two Harris units were they built. Moreover, cancellation of Harris 2 continues to appear likely and Harris 2 was on NRC's list of plants that might be cancelled which was delivered to Congress. This would reduce the capacity increment to 750 MW on a firm basis. That does not account for higher-than-expected forced and scheduled outage rates such as CP&L nuclear units have experienced in 1981 and 1982, nor for D-4 steam generator problems. Further, CP&L has a weather-normal reserve of 40% including Mayo unit 1 being brought on-line in Spring 1983, and a growth rate of 2.9% per year or less, so that Harris 1's capacity would add little if anything to needed reserve margins before 1990, nor would Harris 2 until about 1995. The NCUC's Public Staff has recommended, 2-4-83, canning H2 and delaying H1 to 1990+.

(2) the 70% capacity factor is greater than any Westinghouse PWR of 700 MWe or larger design electrical rating has ever achieved on a lifetime DER basis. Further, the sensitivity cases CP&L claims to have analyzed in ER Amendment 5 take no account of the below-50% capacity factors achieved by operating Westinghouse PWRs such as McGuire #1 (under 40%), Beaver Valley #1 (30.1% DER), Salem 1 (46.9% DER) and others as shown in NUREG-0020 Vol. 6 #5 of August 1982. These sensitivity analyses do not take sufficient account of the influence of steam generator repairs and deratings on capacity factor, nor do they match the higher-than-expected forced and scheduled outage rates CP&L nuclear plants have been achieving. CP&L gave a 30.64% equivalent forced-outage rate for Harris 1 and 2 in its 6-30-82/

15B CP&L's cost-benefit analysis of operation fails to balance both the economic and environmental costs and benefits of ^{Harris} plant ^{PURPA FERC Order 48} filing. operation. BASIS: No environmental benefits are alleged in the

analysis, nor does CP&L contemplate balancing the actual operating costs against the value of the alleged fuel savings.

15C CP&L's sensitivity analysis and computer runs for fuel "savings" computation in ER Amendment 5 underestimate the variable O&M costs associated with operating a nuclear unit such as Harris 1 or 2. BASIS: Testimony of CP&L witness G. Wayne King in NC Utilities Commission Docket No. E-100 sub 41, December 1982, where he states that CP&L's computer programs used for a similar analysis in that docket (to ER Amendment 5 "analysis") does not include most of the variable O&M costs. See Transcript, Vol II at p. 112, for example.

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15D CP&L's sensitiv^{ity} analysis and computer runs or other computation of fuel "savings" resulting from Harris plant operation do not include the costs of modifications and repairs, which CP&L has consistently underestimated for its Robinson 2 and Brunswick plants. Repair costs are necessary to keep Harris running & should be included, since 1975 or thereabouts. ^ BASIS: CP&L actual expenditures for repairs and modifications at Brunswick generally, and at Robinson in connection with steam generator tube repair and steam generator replacement which is proving necessary, and at Robinson to comply with other NRC requirements, e.g. reactor vessel integrity re embrittlement and overcooling, have consistently exceeded CP&L's estimates made of what such expenditures and costs would be, especially estimates made 5 or more years in advance of the occurrences, and including occurrences CP&L has not anticipated that far in advance, but which have necessitated repairs or modifications costing more than CP&L had estimated repairs and modifications of said plants would cost.

15 E CP&L ER Amdt 5 underestimates the cost of nuclear fuel

for the Harris plant, using a levelized figure of 6.7 mills/KWH for 1986-95 and other figures.

BASIS: CP&L does not include any figure for carrying costs of nuclear fuel inventory in its costs; nuclear fuel costs are estimated considerably higher than this, e.g. by the Public Staff of the NC Utilities Commission . E.g. Table II.B.10^{P. 210} of PS 1979 report gives 10-yr levelized cost of 8.1 mills/KWH for H1 and 10.3 mills for Harris 2. Current estimates (1982 dollars)

by the NCUC Public Staff are 11.7 mills/KWH for total nuclear fuel and O&M costs. (Feb 4 '83 report, Appendix _____ and testimony of Thomas Lam, using a discount rate of around 9%). Inflating this forward to 1986 dollars at that rate gives a value about 40% higher, or about 16.4 mills in 1986 dollars. If we subtract from this the 3.92 mills (1990) or 3.57 mills (1986) Harris 2 and 1 (respectively) as filed by CP&L under FERC Order No. 48, 6-30-82 re PURPA, O&M costs for those dates, we end up with fuel in 1986 dollars at about 12.4 to 13 mills, or nearly double CP&L's levelized cost.

It defies common sense and experience to think that the long-term levelized cost of nuclear fuel at a reasonable discount rate would be half the initial cost in 1986, but since CP&L has (carefully?) not provided a discount rate in any of its ER Amendment 5 calculations, one has to rely on common sense here. There is no assurance uranium ore or yellowcake prices will fall after 1986; mining costs will rise; enrichment costs have risen very rapidly as DOE tries to recover its costs; fuel conversion and fabrication costs have also risen and the causes of these increases may not abate. Indeed with large budget deficits, higher inflation in mining, milling, enrichment, conversion and fabrication costs due to salary increases, wage increases, and inflation in costs of materials and supplies and capital, are reasonable to assume.

15 F CP&L's ER Amendment 5 provides no estimate of, or justification for, any costs of coal, coal inventory carrying charges, escalation rates for coal fuel, cost of oil or natural gas as fuels, inventory costs for oil fuel, escalation rates for the prices of oil and natural gas as delivered, variable O&M costs for its ^{Harris plants and} plants fueled by oil, coal, natural gas or some combination or switching among these fuels, ~~startup costs, for oil, gas, coal-firing~~ or for nuclear units at Harris (startup after shutdown, e.g. due to trips, scheduled or forced outages) costs of purchased power (and rationale for an escalation rate for same) and other costs of system operation which are necessary to determine the accuracy, if any, of the system fuel "savings" alleged to result ^{from Harris operation} in ER AMENDMENT 5.

BASIS: These data are not discussed in the amendment, nor mentioned in a way that gives any useful information about the costs. SEE ER 5, sections 8.0, 8.1 and 8.2. These cost data, as well as forced outage rates, scheduled outage rates, assumed capacity factors and rationale therefor, appropriate discount rates, and other costs data (e.g. repair costs, offsite support etc as discussed in other ER 5 contentions herein) are necessary to estimate accurately, and assess the basis of, a fuel savings calculation such as CP&L claims to have done for ER amendment 5. CP&L witness King, NCUC Docket F-100

sub 41 (December '82) (TR. Volume II p. 111) states that CP&L used PROMOD, a computer program which requires virtually all of the data noted above (or its results, e.g. yearly coal, oil and nuclear fuel costs, to estimate avoided costs due to operation of, e.g. a cogenerator on the CP&L system. This is almost surely the same type of computer analysis as that described to me by Applicants' attorney

O'Neill and noted in my November 9, 1982 letter to the Board concerning the completion of these computer runs. In NCUC Docket E-100 sub 41 (Dec. 1982) other witnesses, e.g. expert economist and avoided costs analyst William Marcus (Tr Vol IV, p. 90) testified that by controlling inputs such as these, "you could pretty much get out of the PROMOD model any result you want to get out of it, within fairly broad limits." and that such data are necessary and relevant to getting results from such a model (e.g. Duke Power witness Freund, Tr. Vol VI e.g. 78-81 and 84-89) (Marcus, Tr. IV).

Unless CP&L makes all their inputs and the reasons therefor part of the ER, there is simply no adequate way to assess the reasonableness of these fuel cost estimates or differences in fuel operating costs between nuclear at Harris and other fuels at other CP&L plants or for purchases of power from other systems' plants (e.g. when CP&L's own resources would cost more than power available for purchase).

15 G CP&L's ER Amendment 5 sensitivity analysis of fuel savings from Harris plant operation is incomplete since it fails to assess important sensitivity cases that might well occur. Among these are: operation of either of both Harris units at less than 50% capacity factor; cancellation of Harris 2, as recommended II-4-83 by the NCUC Public Staff, together with Harris 1 operation at less than 70% capacity; Cancellation of Harris 2 and further delay of Harris 1, also recommended by NCUC's consumer-advocate (by statute) Public Staff; operation of Harris 1 alone at a capacity factor under 50% or under 60% without significant system load growth (i.e. CP&L's no-growth case with Harris 1 alone there, at a less than projected C.F.)

BASIS: CP&L's FERC Order 48 filing of 6-30-82, sec 292.302(b) items 1-24, p.2, gives outputs of Harris 1 and 2 corresponding to less than or about 60% Capacity Factor (line 22: 4600 GWH for Unit 1 and 4700 for Unit 2, per year)¹; NUREG-0020, Vol 6, No. 8 (latest I have) identifies numerous large PWRs in the 50% C.F. range and at least 2 Westinghouse ones under 50%, one of which is about 30% (Beaver Valley 1). The V.C. Summer plant, nearly identical to Harris units, is now limited to 50% power due to steam generator problems. It has the same Westinghouse D-4/^{steam}generators incorporated into Harris. McGuire #1, with similar problems in a D-2, has been at no more than 41% capacity (34.5% in NUREG-0020 Vol 6 #8) due to such problems, in spite of several periods of operation at 75% capacity.

The Public Staff's official report of its recommendations for the 1982-83 North Carolina Load Forecast (the hearing is required by NC law, General Statute 110.1 I believe) has Harris 2 cancelled and Harris 1 delayed into the 1990s. The Public Staff's forecast of load growth this time is about half what it was in the 1980-81 Load forecast hearing for CP&L's sales and peaks; if this continues a trend in load forecasts that has occurred since the mid-70s, it may well be that before Harris 1 operates the growth rate will be zero or negative, or the official State estimate adopted by the NC Utilities Commission may be. The actual load affects the fuel savings available from Harris (as ER Amdt. 5 shows, p 8.1.1-1). The occurrences of lower-than-projected capacity factor, cancellation of nuclear units, and lower-than-projected system loads have occurred

¹Other references to this FERC filing above are to the same section on pages 1 or 2.

together in the past both for CP&L and for other utilities. See, e.g., CP&L R8-43 filings of forecasts with NCUC: testimony of Duke Power witness Freund, NCUC Docket E-100 sub 41 (12-82) Tr. Vol VI, 85-86 and 95-96). CP&L cancelled 2 South River nukes in 1978 and 2 of the Harris units in 1981. Thus, it makes sense that all of these circumstances could again occur in the future, or that two or more of them could simultaneously during Harris operation.

15 H CP&L fails to provide an escalation factor or discount rate whereby its levelized values throughout ER AMDT 5 section 8, (and as reproduced in Section 11 thereof) were calculated. Without knowledge of this discount rate, it is impossible to realistically assess the reasonableness of the savings estimated therein, or to compare them with other fuel cost, fuel savings, O&M cost, O&M avoided cost, or other relevant data.

BASIS: Self-evident from ER Amdt 5 omission; common sense.

15 I CP&L evidently used an erroneous discount rate in computing Harris levelized fuel savings in the one case laid out in ER Amdt 5 (Table 8.1.1-2). As best I can compute, this rate is around 10%.

BASIS: CP&L used an 11.7% discount factor in, e.g., King Exhibit 2 and 5 in NCUC Docket No E-100 sub 41 as reflecting CP&L's after-tax cost of debt, which King asserted was appropriate to use to calculate current values of avoided fuel costs paid to small producers. The data King used this 11.7% discount rate on in Exhibit 2 is analogous to the yearly fuel savings of ER Amendment 5, i.e. both are avoided costs calculated by computer (PROMOD or other model) program reflecting different available power resources on CP&L's system.

15 J CP&L should have used a range of discount factors or rates in levelizing the cost data in ER Amendment 5. This range should span at least 4 to 6 percent.

BASIS: No one can know the future costs of debt or the future inflation rate with precision. It is the opinion of economists, e.g. Prof. E. Roy Weintraub of Duke University, that analyses using discount rates should therefore use a range of discount rates (example: 6, 8, 10 and 12% if the best estimate is 8 to 10% per year) to assess the reasonableness of constant-dollar computations and their sensitivity to discount rates. CP&L and most economists and forecasters have erred in forecasting future discount rates in the past, especially for a term extending 13 or so year into the future (ER 5 fuel cases) or 31 years (ER amdt 5 operating cost estimates).

15 K CP&L uses an estimate of nuclear fuel disposal costs which does not reflect either their current rates or the true costs which will have to be paid, eventually.

BASIS: The 1 mill/kwh which CP&L refers to on page 8.2.1-1 of ER Amdt 5 is less than the approximately 1.5 mills/kwh in 1982 NC rates (see fuel adjustment clause proceedings). This cost may be set as to what CP&L will be charged directly, but the taxpayers will have to make up any costs above this for Federal government waste disposal activities. Prof. Bernard Cohen estimated in his Scientific American article some years ago that such costs could be as high as \$250 million per reactor per year. Dividing that by even CP&L's unrealistically high 5.5 billion kWh per Harris unit per year, that's 40 cents/kWh or so. Other government estimates (e.g. DOE's) have been over 1 mill, and have been criticized as unrealistically low (e.g. Komanoff, Nuclear Power Plant Performance, CEP, New York, 1979, where he uses about 1.8 mills).

NOTE, separate from 15 K, on why 15 K could not have been filed earlier: The senate Bill referenced by CP&L (ref 8.2.1-1; ER 8.2.1) had not even been passed until December 1982. Even once it was passed, I could not know CP&L would use the number until I got this amendment 5 to the ER.

ER Amdt 5
 15 L CP&L's fuel cost savings estimates do not take full account of the tendency of CP&L nuclear units to be out of service during periods and seasons of high demand, nor the likelihood of this recurring, in the case of the Harris unit or units.

BASIS: CP&L's ER Amendment 5 does not address this problem. But it does say the fuel savings data come from a computer simulation. These simulations (e.g. PROMOD) may generate a probabilistic schedule of unit outages and deratings which does not match the pattern set by CP&L's Robinson and Brunswick units over the last 2 to 3 years of having numbers of outages begin in or extend through much or all of the summer peak load season or the winter peak load season. I infer that such is the case with these numbers by comparing CP&L's 1986 production cost savings for Harris 1 (\$100 million, ER Amdt 5 Table 8.1.1-2 on page 8.1.1-3) with the \$55 million or so CP&L stated would be the cost of doing without Harris 1 during 1984 (NCUC Docket No. E-100 sub 35, 1979). The latter estimate was made before this pattern of outages of CP&L nuclear units became clear, and thus must not take it into account. CP&L's witnesses in E-100 sub 35 certainly didn't say it did take such a possibility into account. Even allowing 12 or 14% discounting (high rates compared to CP&L's evident 10% in Table 8.1.1-2) of the 1986 Harris 1 number to 1984 dollars, the 1986 savings alleged by ER Amendment 5 are higher in constant dollars than the 1979 Harris 1 fuel savings estimate.

Thus, it is reasonable to conclude that a pattern of summer and winter outages for the Harris units is not included in Table 8.1.1-2 of ER Amdt 5, especially since the Harris 1 (and later, Harris 2) annual nominal fuel savings rise rapidly into the 1990s before leveling off. Thus, they stay at levels that, in constant dollars, are at or above the 1979 estimate levels which did not reflect the summer and winter outage pattern CP&L nukes have developed.

The extensive outages of CP&L nuclear units in peak seasons are the subject of numerous CP&L base load power plant performance reports to the NC Utilities Commission (under Rule R8-46) for 1979 through the end of 1982 (reports filed monthly), and also of hearings under the old NC fuel clause law, e.g. Docket E-2 sub 425, E-2 sub 434, E-2 sub 446, E-2 sub 452. They are well documented. Here I am not citing CP&L's excuses for them, only the fact that they have occurred and that it makes sense to analyze as a sensitivity case a pattern which in fact has happened with considerable regularity.

CP&L has provided no analysis of the likelihood of such problems recurring, e.g. because of pushing the refueling schedules of Harris units into a winter peak or summer peak time period due to other unexpected outages or due to more extensive repairs. Note, for example, the outages of Duke Power's McGuire #1 in summer 1982 to check steam generators and in winter 1983 (now) to attempt repair of same. Harris also has Westinghouse model D steam generators.

15 M CP&L under estimates the uncompensated cost of NRC regulation of Harris, and fails to include the cost of licensing and fees for inspections during operation, *and possible NRC fines.*

BASIS: ER Amdt 5 at 8.2.2-3 says that inspection fees are

omitted from the calculation. Yet these fees are a cost to run Harris, and should be subtracted from any benefits alleged. Further, NRC's budget (which CP&L says it is unable to predict) has risen sharply in recent years, and NRC is one of the few government agencies adding employees under President Reagan. Thus it is reasonable to assume that NRC regulatory costs will rise in the future. This is particularly applicable to CP&L which has had high safety risks at its other operating plants (NRC subjective risk ratings of 8, 9 and 13 for 1981, where the national nuclear plant average is about 1), and thus can be expected to take up more of NRC's resources, either to prevent an accident, or to deal with the consequences of one (or more) that CP&L might have due to its high risk operation.

CP&L has a record of repeated and large NRC fines.

15 N CP&L fails to subtract the administrative and general costs, O&M costs, and nuclear liability insurance costs identified in Table 8.2.1-1 of ER Amendment 5, or other reasonable estimates of such costs of Harris operation, from the fuel savings estimates of Table 8.1.1-2 and other sensitivity cases analyzed. If these per-kwh figures (8.2.1-1 Table) were based on 70% capacity factor, as seems likely, they even more greatly understate the real costs of operating Harris units.

BASIS: That CP&L didn't knock these costs off is pretty clear from their not mentioning them at all in ER 8.1.1 section. Yet, the Harris estimated savings in any of the sensitivity cases of that section cannot be incurred without also incurring the expenses cited above, at an absolute minimum. (They don't include, e.g., repair materials and so on.) The administrative and general staff expansion to take care of Harris is significant, and would not be incurred if Harris did not operate at all.

Since CP&L typically assumes a 70% capacity factor, and says it did in Table 8.2.1-1, actual costs per KWH would obviously be higher at lower capacity factors.

But we can also see how significant these costs are in constant dollars by multiplying the total A&G, O&M and Nuclear Liability Insurance costs of Table 8.2.1-2 (19.6 mills/kWh or about 2 cents/kWh) by the 5.52 billion kWh assumed at 70% capacity factor. This gives nearly \$110 million per unit per year, in constant dollars. If, for example, you knock that off of CP&L's constant dollar fuel savings for the 2 units (total 16 years operation), you take out about 80% of the projected savings. For Harris 1 alone, you subtract 1.1 billion from the 1.136 billion alleged savings (p 8, 1.1-1) and end up with a leveled 36 million.

Moreover, the insurance, administrative, and considerable O&M costs (plus more repairs) will occur at lower capacity factors, and if (as seems reasonable) the total cost of running Harris is not much less in its non-fuel total at 50% capacity factor than at 70%, then the two Harris lower capacity factor cases result in small or zero costs, and no benefits, when the non-fuel operation costs are subtracted. The Brunswick plant costs more to run at its lower capacity factor than it had at higher ones, and the same appears to be true for Robinson 2 (both on a non-fuel total production cost basis).

It may be objected that CP&L hasn't explained how the two levelizations (10 year fuel "savings" and 28 year costs to operate) relate in terms of discount rate, etc. but that does not affect the point that these non-fuel O&M costs have to be incurred to run the plant, and that they are a significant part of the amount of fuel "savings". Taking them into account lowers net savings, therefore. But without incurring the costs of running Harris, there are no savings.

15 "O" CP&L's ER Amendment 5 section 3.1.2.1 estimate of taxes has not been subtracted from Harris fuel "savings" as a cost of operation. They should be.

BASIS: If Harris never operated, it would be scrapped and not incur property taxes based on the money sunk into it. The cost of property tax on Harris unit 1 and unit 2, associated land and improvements, is a cost of operating them just as the taxes on a factory are a cost of operating it. If the factory is closed and its machinery removed, it has much less value. Likewise, were the Harris plant abandoned, or never licensed, its value would be much less, it would be taxed less, and, indeed, CP&L could sell it and thus avoid any tax liability for the site or plant. (If abandoned after an accident, its value would drop, but I'd think it would then be harder to sell, as would nearby land.)

15 P CP&L's operating cost-benefit analysis for Harris, ER Amendment 5, section 8, fails to take into account the costs of major accidents figured at either their probability, or the acceptability of such an accident to the local environment and people (the "avoided cost" of an accident, or the cost people would pay to be sure of avoiding such an accident). It should. No final NEPA analysis should issue without such.

BASIS: NEPA requires that unintended and adverse effects be taken into account, either in numbers or otherwise, in cost-benefit analysis. KSC now requires consideration of serious accidents. CP&L's analysis is therefore incomplete.

15 Q A proper cost-benefit analysis of Harris operation would not confirm the "experience that the operation of a nuclear facility ... validates the cost-benefit balance struck at the

Construction Permit proceeding." (ER Amendment 5, p. 8.1.1-1)

BASIS: The actual operation of CP&L's last nuclear facility, the Brunswick plant, has resulted in far less benefits, and far higher costs, than considered at its CP proceeding. For example, in the years 1981-83, over \$150 million of repair costs will be incurred for Brunswick. Including O&M, Brunswick's cost of power production has equaled or exceeded that for coal plants built near its time frame (e.g. Roxboro 3 and 4; Duke Power's Belews Creek units 1 and 2, operating in 1973, 1980, 1975 and 1976 initially, as compared to 1975 and 1977 for the Brunswick units).

Moreover, Brunswick's fuel savings to the CP&L system have been less than the additional cost of the plant, its personnel, its repairs, and its maintenance, insurance, taxes and depreciation which it incurred compared to an alternative plant like Roxboro 3.

Since the CP balance proved wrong there, it can with Harris. One has only to note the considerable changes in Harris plant parameters (cost, O&M cost, fuel cost, CP&L estimate of future load growth, NCUC estimate of future load growth, additional safety equipment, additional CP&L on and off-site support personnel and so on) to see that the cost-benefit analysis of the CP stage grows shakier all the time.

Similarly, the estimates of fuel savings in operation, and other costs and benefits of operation, put forward by CP&L in ER Amendment 5, may be expected to change in the future, probably in the same pattern as set for Brunswick. More accurate data can be produced for many of these parameters, and relevant data have not been produced for many parameters affecting relative system operating costs with or without Harris 1 and/or Harris 2, as shown in the basis of contentions above (incorporated by reference here for facts shown).

15 R CP&L should ~~analyze~~ analyze fuel cost "savings" from Harris unit operation under the load forecasts of other parties, e.g. that of the NC Utilities Commission Public Staff.

BASIS: ER Amendment 5 section 8.1 shows that CP&L's estimates of fuel savings are sensitive to load growth; new estimates of load growth are being made all the time, even by CP&L, which may or do differ from CP&L's 1981 load forecast (ER 5 sec 8.1.1) used in all of CP&L's sensitivity cases except the no-growth one.

The NCUC Public Staff has filed a new forecast (NCUC Docket No. E-100 sub 46, Feb. 1983) considerably below CP&L's, by about 1% per year in growth rate. The NC Utilities Commission has often adopted official forecast ranging from the company's estimates to the Public Staff's, or thereabouts.

The loads input into a computer analysis of system fuel savings clearly affect the reasonableness of the costs and "savings" derived therefrom. See e.g. testimony in NCUC Docket No. E-100 sub 41 by Duke Power witness Freund, Tr. Vol VI, p, 87 (Dec 1982) where he states he is sure that the loads do affect the costs derived from the PROMOD fuel cost model.

15 S CP&L should analyze fuel cost savings from Harris unit operations under the following assumption: 1 or both Harris units available, with loads less than 1981 levels.

BASIS: The loads do affect the cost savings shown, and system growth rates and estimates thereof have been declining regularly for CP&L since 1973. "Unthinkable" things like electricity sales declines due to price increases have occurred, and given the present trends in electricity sales and peak loads, future loads could well become less than they are today. It certainly is a valid sensitivity case to analyze the future result of such a current

trend, especially one that has continued from 1973 to the present and shows no sign of stopping. This is particularly true when we consider that Harris unit operation will lead to quite substantial rate increases, which can be expected to affect (and reduce) consumption of electricity on the CP&L system. CP&L rate hikes have been producing reductions in sales per customer consistent with a short-term price elasticity of demand of about .2 (i.e. a 10% increase in rates produces a 2% lower sales per customer). See Eddleman testimony, NCUC Docket E-2 sub L16. Harris #1 would raise system rates about 15% upon operation, even with current levels of CWIP left in rates before it comes on-line (if it does). Thus, about a 3% short-run reduction in sales growth would occur. But even CP&L's 1981 forecast is below 3% per year peak growth. If the Public Staff's 1983 forecast proves more accurate, negative growth would occur, and future loads in the 1986-95 period could well be less than in 1981.

Because of the tendency of past CP&L load growth estimates to be regularly too high (see, e.g., testimony of L. von B. Page in NCUC Dockets E-100 sub 35 and E-100 sub 40 where he notes past CP&L overestimates) especially on a weather-normal basis (see, e.g. Eddleman testimony, and my Report in Docket No. E-100 sub 40), and the clear cost of Harris in rate base once it were to be licensed to operate, a "negative growth" case is necessary to consider for an accurate cost-benefit analysis, i.e. one that will not be hopelessly outdated and wrong within a few ^{to 5} years, as most of CP&L's past load forecasts have been.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of CAROLINA POWER & LIGHT CO. Et al.)
Shearon Harris Nuclear Power Plant, Units 1 and 2)

Dockets 50-400
and 50401 O.L.

CERTIFICATE OF SERVICE

I hereby certify that copies of the attached Fiddleman 15 contentions
revisions and amendments, including 15A thru 15 S, 15 X and 15 Y
HAVE been served this 11th day of February 1983, by deposit in
the US Mail, first-class postage prepaid, upon all parties whose
names are listed below, except those whose names are marked with
an asterisk, for whom service was accomplished by _____

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