UTILITY Wisconsin Electric

SITE Point Beach

ENCLOSURES answers to questions

RESPONSE TO ORNL 10 CFR 51 QUESTIONNAIRE

I. Waste Management Questions

A. Spent Fuel

1. Which of the following current techniques for at-reactor storage are you using and how?

A. Re-racking of spent fuel

B. Deleted

C. Above ground storage

D. Longer fuel burnup

E. Other

Response The Point Beach Nuclear Plant spent fuel pool has been re-racked twice since initial plant operation. Initial storage allowed for approximately 208 assemblies. The present storage racks will accommodate 1502 assemblies. Fuel burnup has been increased to 45,000 mwd/mtu for future reloads and reload regions have been reduced to quarter-cores (28 of 121 assemblies).

2. Do you plan on continuing the use of these current techniques for at-reactor storage of spent fuel during the remaining time of your operating license or do you expect to change or modify them in some way?

Response The above technique will continue to be utilized during the remainder of the operating license.

3. Which of the following techniques for at-reactor storage do you anticipate using until off-site spent fuel storage becomes available and how?

A. Re-racking of spent fuel.

B. Control rod repositioning.

C. Above ground dry storage.

D. Longer fuel burnup.

E. Other (please identify).

Response We are currently planning for the use of above ground dry storage.

4. Will the techniques described above be adequate for continued at-reactor storage of spent fuel for the operating lifetime of the plant, including a 20-year period of license renewal, or are you developing other plans?

Response The techniques described above will be adequate for the operating life of the plant, plus a 20-year period of license renewal. The above ground dry storage facility may have to be expanded if DOE does not remove fuel from the site in accordance with the terms of the contract between Wisconsin Electric and DOE.

5. Do you anticipate the need to acquire additional land for the storage of spent-fuel for the operating lifetime of the plant, including a 20-year period of license renewal? If so, how much land? When would this acquisition occur? Where? (if answer is "yes", 3-4 sentences)

Response No additional land will be required.

6. Do you anticipate any additional construction activity on-site, or immediately adjacent to the power plant site, associated with the continued at-reactor storage of spent fuel for the operating lifetime of the plant, including a 20-year period of license renewal? (yes/no)

Response Yes

7. If you answered yes to question 6, briefly describe this construction activity (e.g., expansion of fuel storage pool, building above ground dry storage facilities)

Response We are planning for the construction of an above ground Independent Spent Fuel Storage Installation.

B. Low-Level Radioactive Waste Management Questions

1. Under the current scheme for LLRW disposal (i.e., LLRW Policy Amendments Act of 1985 and regional compacts) is there currently or will sufficient capacity for wastes generated during the license renewal period be available to your plant(s)? If so, what is the basis for this conclusion?

Response Wisconsin is a member of the Midwest LLRW Regional Compact. Currently this compact has no regional disposal site. Although there has been progress on site studies in the initial host state, it is likely the opening of a regional compact site will be delayed beyond 1993. If site development proceeds as contemplated in the LLRW Act, sufficient capacity for disposal will exist.

2. If for any reason your plant(s) is/are denied access to a licensed disposal site for a short period of time, what plans do you have for continued LLRW disposal?

Response On-site storage is available for DAW. We anticipate available storage could accommodate our LLRW disposal needs for up to

five years.

3. In a couple of pages, please describe the specific methods of LLRW management currently utilized by your plant. What percentage of your current LLRW (by volume) is managed by:

   A. Waste compaction? _____
   B. Waste segregation (through special controls or segregation at radiation check point)? _____
   C. Decontamination of wastes? _____
   D. Sorting of waste prior to shipment? _____
   E. Other (please identify) _____

Response At Point Beach DAW is seperated into metals and non-metal. The metals are shipped off-site to a vendor for decon and release or volume reduction and burial. Non-metal waste is packaged in drums and shipped to a super compactor facility for volume reduction and shipment to a burial site. Liquid wastes are processed in an evaporator and the evaporate concentrates, along with expended waste stream resins are solidified with cement and shipped off-site for burial.

Specific estimated percentages for the management methods listed above are:

A. 60%
B. 100%
C. 30%
D. 0%
E. 10% Solidification of resins and concentrates

4. In a couple of pages, please describe the anticipated plans for LLRW management to be utilized by your plant(s) during the remainder of the operating license and through the license renewal term.

Response At the present time our response to this question would be the same as question 3.

5. Do you anticipate the need to acquire additional land for the storage of LLRW for the operating lifetime of the plant, including a 20-year period of license renewal? If so, how much land? When would this acquisition occur? Where? (if answer is "yes", 3-4 sentences)

Response We do not anticipate the need to acquire additional land during this time frame. We already own a significant amount of land around the plant site.

6. To provide information on the timing of future low-level waste streams, if you answered yes to question #9, over what periods of time are these activities contemplated?

Response A schedule for the activity discussed in the response to question 9 has not been promulgated.

7. Do you anticipate any additional construction activity, on-site or immediately adjacent to the power plant site, associated with temporary LLRW storage for the operating lifetime of the plant, including a 20-year period of license renewal? (yes/no)

8. If you answered yes to question 7, briefly describe this construction activity (e.g., storage areas for steam generator components or other materials exposed to reactor environment).

Response Yes. We will probably need to modify existing structure to facilitate interim storage of LLRW. If long term storage of LLRW becomes necessary, additional storage facilities would have to be constructed.

9. To provide information on future low-level waste streams which may effect workforce levels, exposure, and waste compact planning, do you anticipate any major plant modifications or refurbishment that are likely to generate unusual volumes of low-level radioactive waste prior to, or during, the relicensing period for the plant? If so, please describe these activities. Also, what types of modifications do you anticipate to be necessary to achieve license renewal operation through a 20-year license renewal term?

Response It is possible that the Point Beach Unit 2 steam generators will require replacement prior to the end of our initial license period. The activity was completed for Unit 1 during the 1983-1984 time period. Our response to questions in other sections of the questionnaire provides more details regarding this activity. At this time we cannot anticipate or predict what specific modifications will be necessary for license renewal.

II. Aquatic Resource Questions

1. Post-licensing modifications and/or changes in operations of intake and/or discharge systems may have altered the effects of the power plant on aquatic resources, or may have been made specifically to mitigate impacts that were not anticipated in the design of the plant. Describe any such modifications and/or operational changes to the condenser cooling water intake and discharge systems since the issuance of the Operating License.

Response In response to frazil ice problems, the intake structure was modified in 1980 to provide unencumbered flow paths for cooling water flow through the leaky dam intake structure. During this modification, four 6'x6' concrete conduits were installed within the south half of the circular leaky dam structure. The openings of these conduits were fitted with removable steel grates. The dimensions of the grate openings are 1" (width) by 4" (height). The grates are placed over the openings in early spring following the termination of winter warm water recirculation to reduce fish entrainment. The grates are removed in late autumn of each year to reduce ice blockages.

No substantial modifications have been made to the onshore thermal discharge flumes.

2. Summarize and describe (or provide documentation of) any known impacts on aquatic resources (e.g., fish kills, violations of discharge permit conditions) or National Pollutant Discharge Elimination System (NPDES) enforcement actions that have occurred since issuance of the Operating License. How have these been resolved or changed over time? (The response to this question should indicate whether impacts are ongoing or were the result of start-up problems that were subsequently resolved.)

Response There have been no violations of discharge permit conditions that have triggered enforcement actions nor have there been any known impacts on aquatic resources that could be attributed to minor violations that have occurred over the years.

3. Changes to the NPDES permit during operation of the plant could indicate whether water quality parameters were determined to have no significant impacts (and were dropped from monitoring requirements) or were subsequently raised as a water quality issue. Provide a brief summary of changes (and when they occurred) to the NPDES permit for the plant since issuance of the Operating License.

Response In November, 1988, the Wisconsin Department of Natural Resources (DNR) removed chlorination requirements from the WPDES permit for the plant's sewage treatment facility. The treatment facility was also no longer required to monitor or

meet limits for total residual chlorine or for fecal coliform. This change in the permit was a result of changes in the DNR's policy toward chlorination requirements. Since DNR determined that there was little or no potential of whole body water contact in close proximity to the discharge, chlorination was not required to control coliform levels in the plant discharge. The DNR also noted the fact that large amounts of dilution occur when the sewage treatment facility effluent mixes with the condenser cooling water flow. Since concerns over the use of chlorine outweigh water quality concerns related to coliforms in this portion of Lake Michigan, DNR removed the chlorination requirements.

4. An examination of trends in the effects on aquatic resources monitoring can indicate whether impacts have increased, decreased, or remained relatively stable during operation. Describe and summarize (or provide documentation of) results of monitoring of water quality and aquatic biota (e.g., related to NPDES permits, Environmental Technical Specifications, site-specific monitoring required by federal or state agencies). What trends are apparent over time?

Response The impact of Point Beach Nuclear Plant operations on aquatic resources was ascertained over a five year period (1972-1977). The following - Summary of Effect - statement, which has been transcribed from the five year summary report, provides a concise overview of impact-related studies conducted at this facility.

SUMMARY OF EFFECTS

Five years of study in Lake Michigan near the Point Beach Nuclear Plant have revealed very few effects of plant operation on the physical, chemical and biological environments. This section summarizes those effects in all portions of the environment examined during the five-year study.

Physical Environment

The operation of the Point Beach plant has not affected the height of the scarp or the length of the beach, nor caused erosion of the bluff to the north and south of the plant. Lake sediment types in the area of the plant have not changed significantly, although a small area of scour and resulting sand deposition off of the discharge was noted during all years studied. No trends in dissolved oxygen concentration or pH attributable to plant operation were noted. Thermal plume measurements revealed essentially stable plume sizes since Unit 2 start-up in October 1972.

Chemical Environment

No significant alteration of Lake Michigan water chemistry has occurred as a result of plant operation. Mean concentrations of all parameters examined have been within the range expected for western nearshore regions of the lake. Total copper concentrations in the discharge area were consistently slightly higher than those in the intake due to scouring of copper from the condenser tubing. The copper concentrations in the discharge did not exceed Wisconsin water quality standards, or WPDES discharge limitations. Plant operation did not affect nearshore total copper concentrations since concentrations in the plume areas were not consistently higher than those in the reference areas. Slightly elevated copper concentrations in the discharge were judged not to be ecologically significant.

Biological Environment

Plant operation did not affect densities of total bacteria, fecal coliform bacteria or fecal streptococci bacteria, although during three months of study, fecal streptococci were much more numerous in the plume than in the reference areas. This was not judged to be a plant-related effect due to the nature of fecal streptococci pollution and the natural patchiness of bacterial populations.

Statistical differences in the densities of total phytoplankton, green algae, and blue-green algae between plume and reference areas, and between reference areas were noted over five years of study. There was no pattern to the differences that would indicate that they were plant-related. Phytoplankton diversity and diatom densities in the plume were similar to those found in reference areas. The thermal discharge increased the productivity of phytoplankton entrained in the condenser. This effect was transient due to the rapid cooling of the plume in Lake Michigan.

Five years of study indicated that the discharge from the Point Beach plant can cause higher densities of blue-green algae on artificial substrates placed in the plume than on substrates placed in reference areas, can extend growing seasons of blue-green algae on artificial substrates in the plume, and can lower densities of diatoms on artificial substrates in the plume. It is also possible that the plant stimulated the productivity of periphyton in the plume. Due to the lack of naturally occurring substrates in the area of the plant, these experimentally derived changes were concluded not to be ecologically significant.

Although zooplankton diversity was higher in the plume than in reference areas over five years of study, no differences in numbers of zooplankton between plume and reference areas

could be detected. Entrainment of zooplankton in the condensers results in a mean mortality of approximately 10.8% of those entrained over five years of study. This mortality was judged insignificant due to high zooplankton reproductive rates.

It was concluded from five years of study that the north plume area, and especially, the south reference area provided much better benthic habitat that did the other areas studied. This phenomenon was a result of the substrates present, and not due to plant operation. No ecologically significant effects of plant operation on the benthic community could be detected.

Brown trout and rainbow trout appeared to actively seek the thermal plume during the winter months, and alewife were collected in greater numbers in the plume during spawning runs. Certain other fish were found in reference areas in greater numbers than in the plume, but this may be due to a preference for substrate or benthic food organisms present. Various species appeared to be significantly longer, heavier or in better condition in either the plume or reference areas over five years of study, but there was no pattern to these differences and it was probable that they were not plan-related. The area of the Point Beach plant does not appear to be unique or important spawning habitat.

Although relatively large numbers of fish were impinged during certain years at the plant, over five years of study, 99% of all fish impinged were smelt and alewife. Very few salmon or trout were impinged by the plant. Estimates of the numbers of fish in Lake Michigan indicate that the loss of fish impinged by the plant are insignificant to the Lake Michigan population.

The impacts of plant operation as summarized above are transient or have insignificant effects on the limnology of Lake Michigan. Five years of study near the plant have failed to reveal any long-term or important effects caused by plant operation.

5. Summarize types and numbers (or provide documentation) of organisms entrained and impinged by the condenser cooling water system since issuance of the Operating License. Describe any seasonal patterns associated with entrainment and impingement. How has entrainment and impingement changed over time?

Response Entrainment of icthyoplankton was confined principally to alewife, smelt, and sculpin. Alewife egg and larvae numbers and smelt larvae numbers were minute relative to the reproductive potential of these prolific, early-maturing species. Sculpin, though less prolific, are also extremely abundant in Lake Michigan, and it is very unlikely that entrainment at Point Beach Nuclear Plant has a discernible impact on the population. Entrainment of Pontoporeia affinis and Mysis

relicta was not high in comparison with reports of offshore abundance. Although these epibenthic invertebrates frequent the nearshore area, they are found at much higher densities near the bottom in deeper water. In summary, entrainment impact at the PBNP is minimal.

Although a diverse number of fish species were collected from the Point Beach traveling screens, most were captured in such low numbers that impact was obviously insignificant. Alewife and smelt accounted for approximately 98% of the estimated annual impingement by weight. The magnitude of alewife and smelt impingement is so minuscule relative to the size of the populations of these species in Lake Michigan that impact on the populations must be considered negligible. In addition, it is thought that many of the alewife were dead before they entered the plant.

Impingement of trout and salmon can not be evaluated in a strict ecological sense, since these species are artificially maintained as a recreational resource. Useful evaluation of impact on salmonids should be made on a socio-economic basis. In terms of potential loss to fishermen, impingement of salmonids at PBNP represents less than one-tenth of one percent of the annual Wisconsin sport catch from Lake Michigan. A cost benefit analysis would certainly show that application of remedial technology to alleviate salmonid impingement is not warranted.

Other species were impinged at PBNP in very low numbers relative to their abundance in the lake. Impact was negligible.

On the basis of a 1975-76 monitoring study, it is apparent that entrapment of adult and juvenile fish, icthyoplankton, and benthic macroinvertebrates in the cooling water intake system of Point Beach Nuclear Plant at most constitutes a very local and minor reduction in abundance of these organisms. The impact on the environment must be considered to be minimal and insignificant.

Regarding seasonal patterns in impingement, alewife were impinged in greatest numbers during two periods; May-July, and October-November. During the first period, the plant impinged primarily age class 2+ alewife while in autumn, the plant impinged primarily young of the year alewife.

On the other hand, smelt were impinged during every month but in greatest number during autumn when the plant impinged primarily young of the year smelt.

No follow-up studies on the order of the 1975-76 study have been conducted. However, since alewife and smelt remain the most abundant species in Lake Michigan, it is not unreasonable to assume that they continue to be impinged in numbers proportional to their abundance in the lake.

6. Aquatic habitat enhancement or restoration efforts (e.g., anadromous fish runs) during operation may have enhanced the biological communities in the vicinity of the plant. Alternatively, degradation of habitat or water quality may have resulted in a loss of biological resources near the site. Describe any changes to aquatic habitats (both enhancement and degradation) in the vicinity of the power plant since the issuance of the Operating License including those that may have resulted in different plant impacts that those initially predicted.

Response There have been no changes in aquatic habitat attributable to plant operations since the issuance of the operating licenses.

7. Plant operations may have had positive, negative, or no impact on the use of aquatic resources by others. Harvest by commercial or recreational fishermen may be constrained by plant operation. Alternatively commercial harvesting may be relatively large compared with fish losses caused by the plant. Describe (or provide documentation for) other nearby uses of waters affected by cooling water systems (e.g., swimming, boating, annual harvest by commercial and recreational fisheries) and how these impacts have changed since issuance of the Operating License.

Response According to Argonne National Laboratory scientists, the plant has had a positive impact on the area recreational fishery. The plant's thermal discharge seasonally attracts salmonids and other sportfish to the near shore area wherein both shore and boat fishermen capitalize on the enhanced fishing opportunity.

The plant has had a negligible impact on commercial fishermen. The plant impinges a few commercially important species. Most commercial fishing occurs miles from the plant, beyond the area influenced by the thermal plume.

The plant has had no impact on area swimming opportunities. Point Beach State Park, approximately 3 miles south of the plant, provides excellent swimming opportunities. It is beyond the area influenced by the thermal plume.

8. Describe other sources of impacts on aquatic resources (e.g., industrial discharges, other power plants, agricultural run-off) that could contribute to cumulative impacts. What are the relative contributions by percent of these sources, including the contributions due to the power plant, to overall water quality degradation and losses of aquatic biota?

Response The only other discharge source in close proximity to Point Beach Nuclear Plant is the Kewaunee Nuclear Plant. Discharges are essentially similar to those at Point Beach. There are

no cumulative environmental impacts which are causing an overall water quality degradation or loss of aquatic biota near the plant.

9. Provide a copy of your Section 316(a) and (b) Demonstration Report required by the Clean Water Act. What Section 316(a) and (b) determinations have been made by the regulatory authorities?

Response State agencies reviewed the studies done in the 1970's and concluded that there were no significant effects requiring remedial action. Due to the size of the 316(a) and 316(b) reports they are not being provided.

III. Socioeconomic Questions

1. To understand the importance of the plant and the degree of its socioeconomic impacts on the local region, estimate the number of permanent workers on-site for the most recent year for which data are available.

Response In 1989 the permanent staff at the Point Beach Nuclear Plant numbered 322.

2. To understand the importance of the plant to the local region, and how that has changed over time, estimate the average number of permanent workers on site, in five-year increments starting with the issuance of the plant's Operating License. If possible, provide this information for each unit at a plant site.

Response 1970-88 1975-95 1980-152
1985-241 1990-324

3. To understand the potential impact of continued operation for an additional 20 years beyond the original licensing term, please provide for the following three cases:

A) a typical planned outage;
B) an ISI outage; and
C) The largest single outage (in terms of the number of workers involved) that has occurred to date

an estimate of additional workers involved (for the entire outage and for each principal task), length of outage, months and year in which work occurred, and cost. Also, estimate occupational doses received by permanent and temporary workers during each principal task.

Response A.) Typical Planned Outage

Point Beach Nuclear Plant presently operates with a 12 month operating cycle, thus each unit experiences a typical maintenance/refueling outage of from 40 to 45 days once each year. In recent years Unit 1 has been refueled in spring, usually between late March and early May, and Unit 2 in fall, typically late September or early October through mid-November. An estimate of additional works listed by task follows. A chart of occupational doses received by permanent and temporary workers for 1988 and 1989 as reported to the NRC in our "Annual Results and Data Report" is also provided.

Activity	Additional Personnel
Overall Maintenance	20
Insulation	6
Steam Generator Sludge Lance/ Steam Generator Inspection	12 15
Heat exchanger cleaning	8
Health Physics Support	35
Miscellaneous Electrical	15
Miscellaneous Electrical	8

B.) Inservice Inspection

A refueling reactor vessel maintenance outage which includes, a 10 year inservice inspection, will generally extend the time for the outage. Point Beach Nuclear Plant completed a ISI outage in fall 1989 which lasted 63 days. In addition to the additional people required for other outage items the following ISI additions may be typical.

Activity	Additional Personnel
ISI Primary, Secondary	9
Reactor Vessel Inspection	12
Turbine Inspection	12
Integrated Containment Leak Rate Test	2

C.) Largest Single Outage

The largest single outage that has been experienced at the Point Beach Nuclear Plant was for the replacement of the Unit 1 steam generators. This outage commenced in October 1983 and concluded on April 9, 1984 for a total of 190 days. Over the course of the outage it is estimated that approximately 600 additional works were involved. The occupational doses received for the steam generator replacement project was 697 Man-Rem.

We have included no estimated cost figures for these outages.

1988

4.0 NUMBER OF PERSONNEL AND PERSON-REM BY WORK GROUP AND JOB FUNCTION

Job Group	Number of Personnel Greater Than 100 mrem	Total rem For Job Group	Work Function and Total Person-Rem					
			Reactor Operations & Surveillance	Routine Maintenance	Inspections	Special Maintenance	Waste Processing	Refueling
Station Employees								
Operations	60	32.320	23.590	------	5.820	------	------	2.910
Maintenance	51	51.270	------	34.350	3.070	4.620	------	9.230
Chemistry and Health Physics	40	32.065	30.925	------	------	------	1.140	------
Instrumentation and Control	14	3.980	------	1.440	0.050	1.160	------	1.330
Reactor Engineering	4	1.240	0.120	------	0.270	------	------	0.850
Administration and Engineering, Quality & Regulatory Services	11	4.780	1.510	------	3.250	------	------	0.020
Utility Employees	52	39.380	3.510	22.990	2.980	3.010	------	6.890
Contract Workers and Others	299	222.220	0.380	------	6.800	205.370	9.670	------
GRAND TOTALS	531	387.255	60.035	58.780	22.240	214.160	10.810	21.230

1989

4.0 NUMBER OF PERSONNEL AND PERSON-REM BY WORK GROUP AND JOB FUNCTION

Job Group	Number of Personnel Greater Than 100 mrem	Total rem For Job Group	Work Function and Total Person-Rem					
			Reactor Operations & Surveillance	Routine Maintenance	Inspections	Special Maintenance	Waste Processing	Refueling
Station Employees								
Operations	65	36.520	26.780	------	7.130	------	------	2.610
Maintenance	47	78.820	------	53.910	3.170	5.490	------	16.250
Chemistry and Health Physics	37	41.400	38.890	------	------	------	2.510	------
Instrumentation and Control	14	4.630	------	3.460	0.070	0.250	------	0.850
Technical Services	4	0.720	0.200	------	0.100	------	------	0.420
Administration, Engineering and Regulatory Services	23	9.230	2.660	------	6.310	------	------	0.260
Utility Employees	28	36.110	3.730	18.260	2.760	1.860	------	9.500
Contract Workers and Others	313	266.960	0.680	------	19.300	236.900	10.080	------
GRAND TOTALS	531	474.390	72.940	75.630	38.840	244.500	12.590	29.890

4. To understand the plant's fiscal importance to specific jurisdictions, for 1980, 1985, and the latest year for which data are available, estimate the entire plant's taxable assessed value and the amount of taxes paid to the state and to each local taxing jurisdiction.

Response Power plants in the State of Wisconsin are exempt from property tax, so none are paid to the state or the local jurisdictions. A gross receipts tax is paid into the states general fund and is allocated back to the local governments. A special allocation is made to local jurisdictions which have power plants within their borders, and the amount of the allocation is based on the book value of the specific plant(s). The allocation formula is determined entirely by the state; consequently, it is difficult to assess Point Beach's fiscal importance to specific jurisdictions. For the years 1980, 1985 and 1990, it is estimated that the township and county in which the plant is located received the below listed allocations:

	Two Creeks Township	Manitowoc County
1980	$150,000	$467,000
1985	$150,000	$545,000
1990	$150,000	$600,000