

CONSUMERS POWER COMPANY
ANNUAL ENVIRONMENTAL OPERATING REPORT
PALISADES PLANT
50-255

1.0 BACKGROUND

Appendix B to Provisional Operating License No DPR-20 for the Palisades Plant is entitled "Environmental Protection Plan (Non-Radiological)". This document is dated January 22, 1981. On Page 5-2, this document requires Consumers Power Company to submit to the Nuclear Regulatory Commission an Annual Environmental Operating Report which describes implementation of the Environmental Protection Plan (EPP). The period covered by this first annual report is January 22, 1981 to January 1, 1982.

2.0 COOLING TOWER METEOROLOGICAL IMPACT STUDY

The EPP calls for the Annual Report to include discussion of those activities required by Sub-section 4.2 of the EPP. Those activities originally included an extensive program to monitor meteorological parameters in order to define the environmental impact of cooling tower operation on the area surrounding the Plant. Section 4.2.1 of the EPP required that this monitoring be conducted for at least two years after conversion to cooling towers. The conversion took place in April of 1975, and the cooling tower drift and plume studies were completed in 1978. These reports were submitted to the NRC. The study showed that cooling tower effects relative to meteorology were limited to locations within 200 meters of the cooling towers. The most serious cooling tower effect was shown to be icing taking place with the drift and plume in a downwash condition. Icing effects were generally limited to 200 meters downwind, and the main environmental impact of icing was damage to vegetation. The most severe damage was limited to within a 200 foot radius of the cooling towers and included the death of approximately 2,000 trees. Deposition of sulfates from the cooling tower plume has also contributed to vegetation damage and tree loss within 100 meters of the cooling towers. The total area exhibiting any effects to vegetation is on the order of 25 acres. In summary, it has been demonstrated that cooling tower effects are very localized, and that impact on the environment or on Plant operation, is negligible. Since activities relating to the study of cooling tower effects have been completed, further reporting on this topic will not be done in the Annual Environmental Operating Report.

2.1 COOLING TOWER THERMAL POLLUTION STUDY

An operating change was implemented on March 3, 1981, in which cooling tower blowdown was increased by 50,000 gallons per minute of lake water while lake water dilution of 60,000 gpm to the mixing basin was eliminated. This results in a net decrease of 10,000 gpm to discharge point 001. The number of discharge pipes to the lake have been reduced from eight to four in order to increase the discharge velocity and enable better mixing to take place.

A new thermal plume study was conducted by Consumers Power Company in order to assess the environmental impact of the change in cooling tower operation. This study involved measuring temperature profiles in the mixing zone once during each season of 1981.

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2.1 (Cont'd)

The results of the thermal plume study indicate that the thermal plume affects only a small fraction of the allocated 72 acre mixing zone in Lake Michigan. The change in cooling tower blowdown has not created any adverse environmental effects.

2.2 CHLORINE MINIMIZATION STUDY

The NPDES Permit for the Palisades Plant allows a daily maximum of 0.3 mg/liter of Total Residual Chlorine at Discharge Point 001. The daily average total residual chlorine discharge permitted is 0.2 mg/l.

The NPDES Permit also requires Consumers Power Company to conduct a study of the magnitude of the free chlorine component of total residual chlorine in outfall 001. This study will gather data for each of the four seasons of the year to ascertain whether the average free chlorine component can be reduced to less than 25% of the total residual chlorine.

If the study indicates that the free chlorine component cannot be sufficiently reduced, the NPDES Permit may be modified to limit the total residual chlorine to the level defined by the Freshwater Criteria Curve by Mattice & Zittle. The allowable chlorine residual could range from as low as .0015 ppm to 0.2 ppm depending upon the duration of the chlorination operation.

At this point in time, Consumers Power Company is still at Phase B of the planned study, which is directed at establishing baseline information on the free chlorine/total residual chlorine ratio under normal conditions. The part of the study directed at reducing levels of chlorination is scheduled to start in April 1982.

2.3 HERBICIDE USE

The only other activity covered in Sub-section 4.2 relates to the use of herbicides along transmission line corridor right-of-ways. Consumers Power Company does conform to EPA and state requirements relative to herbicide use. Herbicides were not used at Palisades during this reporting period. The most recent herbicide application at Palisades was on July 22-23, 1980. On that occasion, 48 acres were treated with 100 gallons per acre of a solution consisting of 3 quarts Tordon 101 and 1 quart of Banvel 4WS to 100 gallons of water. Application of herbicide was by spraying and power line right-of-way from the Palisades Plant out to the Blue Star Highway was treated. Tordon 101 is a trade name for Pichloram and Banvel 4WS is a trade name for Dicamba. Records are maintained on herbicide application at the Consumers Power Company General Office in Jackson, and are available for NRC inspection.

3.0 NPDES RELATED NON-COMPLIANCES

Appendix B to Provisional Operating License No DPR-20 for the Palisades Plant also requires that the Annual Environmental Operating Report should include a list of EPP non-compliances and corresponding corrective actions.

The following tables summarize non-compliances and non-routine reports for 1981 which pertain to environmental matters.

3.0 (Cont'd)

The data presented in the tables indicate that the only environmental problem which has any definite pattern is the occasional exceedence of the grease and oil limits for discharge number 00G which is turbine sump oil separator waste water. Consumers recognizes that the present oil separator system is not adequate to handle the load imposed by the maximum hydraulic flows which occur. (Non-compliances Table Attached).

3.1 NON-ROUTINE REPORTS

- 1) For the period of 4/13 to 4/19/1981, analysis of cooling tower blowdown (outfall OCC) was not done for sulfate ion due to technician oversight. Corrective action consisted of administrative change to incorporate this analysis into the weekly water analysis system.
- 2) For the period 7/28 to 8/2/81, daily grab samples for pH measurement and weekly grab samples for sulfate analysis on cooling tower blowdowns were not taken. Corrective action consisted of modifying plant procedures, and instructing technicians to adhere strictly to regulatory requirements.
- 3) On 4/15/81 a spill occurred when an acid feed line to the south side of cooling tower B failed. Approximately 300 gallons of sulfuric acid was released to the sand. The acid was neutralized in-situ with limestone, and the contaminated sand was removed for disposal in an approved landfill.
- 4) During the period 7/28 to 8/2/81, pH and sulfate were not monitored for outfall OCC. Corrective action involves modification of plant procedures to reflect regulatory requirements.
- 5) On 9/3/81 the discharge limit for oil and grease for outfall 00G was exceeded, but the company failed to report the exceedence to Michigan Department of Natural Resources. Corrective action involves changing administrative procedures.

3.2 OIL-WASTEWATER PROBLEM

A study was done of the present oil separation system which consists of a Baffle type oil interceptor built by Zurn Industries followed by a filter cartridge type Oil Emulsion Separator System manufactured by Fram. The report on this study was dated July 13, 1981, and was entitled "Evaluation of Palisades Plant's Oily Waste Water Treatment System." This study was a preliminary assessment of the problem rather than a design type study but several conclusions were presented. The key conclusion was that the system was underdesigned for the hydraulic loading presently being placed on the system. A follow-on design study has been authorized to provide an engineering design for an improved system. The turbine sump has a capacity of

3.2 (Cont'd)

only 658 gallons. The sump overflows into the condensate pump pit, and this provides some additional capacity. A major sump overflow would create serious plant operation problems. The interceptor unit built by Zurn is also too small, and does not provide adequate residence time for oil to be removed when the system is operated at 100 gallons per minutes. Since the interceptor does not do an adequate job of preliminary oil removal, the emulsion breaker is challenged with higher concentrations of oil than it was designed for. This results periodically in poor performance by the emulsion breaker, and high levels of oil discharged to Tank T-41, the turbine building drain tank.

As mentioned earlier, a follow-on engineering design study has been authorized and will commence shortly. The study will include recommendations for installation of a continuous oil monitoring instrument on Tank T-41 to allow much quicker response to plant upset conditions. Consumers Power Company is confident that implementation of the engineering design will provide a long-term cure to the problem.

NONCOMPLIANCES

DATE OF INCIDENT	DISCHARGE NUMBER	NATURE OF INCIDENT	CORRECTIVE ACTION
01-81	OOD	Monthly average for total suspended solids for January was 44.33 mg/liter with 30 mg/liter permitted.	Corrective action consists of continued scrutiny of neutralizer tank operating conditions.
01-05-81	OOG	29.1 mg/liter of oil & grease with 20 mg/liter permitted.	Corrective action consisted of replacing ruptured emulsion breaker filter element.
02-03-81 02-23-81 02-24-81	OOG	Oil & Grease 33.8 mg/liter* Oil & Grease 468.9, 103.2 Oil & Grease 56.6	Conducted maintenance on emulsion breaker.
02-81	OOG	Daily Average Oil & Grease for February was 62.4 mg/liter	
06-08-81	OOG	Oil & Grease 32 mg/liter	Changed emulsion breaker cartridge filters.
07-02-81	OOG	Oil & Grease 26 mg/liter (part of treatment system was bypassed for maintenance.	Repairs were completed.
07-17-81	OOG	Oil & Grease 68.5 mg/liter	Changed emulsion breaker cartridges and changed absorbent pillows in Tank T-41.
08-10-81	OOG	Oil & Grease 35.0 mg/liter (caused by pressure surge created by plant power upset).	Closed Tank T-41 discharge and replaced emulsion breaker filter elements.
09-03-81	OOG	Oil & Grease 176.3 mg/liter and 61.0 mg/liter	Greater efforts will be made to review monthly operating report data to control situation.

NONCOMPLIANCES (Cont'd)

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DATE OF INCIDENT	DISCHARGE NUMBER	NATURE OF INCIDENT	CORRECTIVE ACTION
09-10-81	OOD	2.3 mg/liter of Phosphorus with 2.0 mg/liter permitted.	Eliminate use of Phosphate based cleaners. Effective 10/8/81.
09-30-81	OOD	Monthly average for total suspended solids for Sept was 41.7 mg/liter with 30 mg/liter permitted.	Eliminate the stocking improper filters and modify filter change-out procedure.
09-28-81	OOG	Oil & Grease 31.0 mg/liter	Greater efforts will be made to review monthly operating report data to control situation.
10-81	OOD	Monthly average total suspended solids limit of 30 mg/liter was exceeded. October average was 31.86 mg/liter. Total phosphorus October average was 2.3 mg/liter.	Situation was due to heavy use of laundry system. Problem will probably not recur.
10-06-81	OOG	Oil & Grease 21.7 mg	No apparent cause could be determined, therefore, no action was taken.
10-14-81	OOF	Total suspended solids was 120 mg/liter (100 mg/liter is permitted).	Neutralizer tank was released because of a misunderstood verbal command. Adherence to procedure HP3.6 will prevent recurrence.

* The one-day maximum oil concentration permitted by the NPDES Permit is 20 mg/liter.