

Mr. Sidney J. Holbrook
D10154/Attachment/Page 1
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THE FALL 1995-WINTER 1996 REFUELING
OUTAGE AT MILLSTONE NUCLEAR POWER
STATION UNIT 1 AND EXTENDED SHUT
DOWN OF ALL MNPS UNITS RELATIVE TO THE
1996 LARVAL WINTER FLOUNDER SEASON

NORTHEAST NUCLEAR ENERGY COMPANY
MILLSTONE NUCLEAR POWER STATION
NPDES PERMIT No. CT0003263

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Millstone Unit 1

The major objective of each nuclear fuel cycle is to operate until the "end of full power life." Upon start-up from its previous refueling outage in May 1994, the next refueling outage for MNPS Unit 1 was initially scheduled for early 1996, assuming operation at an average 86% reactor capacity factor for the fuel cycle and a fuel load of 538 Effective Full Power Days (EFPD). However, soon after start-up, Unit 1 personnel identified minor leakage from reactor fuel into the reactor coolant system. Therefore, the method of reactor fuel management was revised, which successfully prevented further degradation to the fuel for the duration of the operating cycle. This revised method of fuel management significantly reduced the available fuel load to about 462 EFPD and accordingly, the next refueling outage date was rescheduled for fall of 1995. Unit 1 operated well during this fuel cycle at a reactor capacity factor of greater than 89% and the refueling outage started on November 4, 1995. The start-up of Unit 1 was delayed beyond the original January date and the shutdown extended throughout the larval winter flounder season.

Millstone Units 2 and 3

Unit 2 was shut down on February 20, 1996 to address issues associated with valves in a safety system. Similarly, Unit 3 was shut down on March 30, 1996 to modify a set of containment isolation valves.

Both outages were unplanned and, thus, no consideration had been given to the larval winter flounder season. However, each outage was extended through the entire larval winter flounder season, so the impact of MNPS during the 1996 reproductive season was minimal.

**REDUCTION IN LARVAL WINTER FLOUNDER
ENTRAINMENT DURING 1996**

MNPS cooling-water flow was reduced considerably during the April 1-June 15 larval winter flounder season. Based on preliminary data, Unit 1 only used 3% of nominal cooling-water flow (only some service water pumps were in operation), Unit 2 about 30%, and Unit 3 approximately 25%. Based on the fraction of total cooling-water flow at MNPS used by each unit (22.7, 29.2, and 48.1% for Units 1 through 3, respectively), the station as a whole used only about 21.5% of nominal water cooling-water volume. This is the smallest fraction of capacity used at MNPS during the larval winter flounder season since 1974, when only Unit 1 was online. This should result in a small larval entrainment estimate as well as a small Niantic River larval production loss estimate for use in the impact assessment model.

Mr. Sidney J. Holbrook
D10154/Attachment/Page 2
September 26, 1996

Temporal distribution of larval winter flounder can vary from year to year, likely due to many biological and environmental factors (NUSCO 1996). Observations to date suggest that the larval winter flounder season was extended this year because of cold winter and spring water temperatures. However, the continued outages of MNPS units through spring into summer made the longer larval season irrelevant in terms of MNPS impact. Because entrainment samples taken this year are now being processed, a more precise estimate of the effectiveness of the MNPS shutdowns cannot be made at this time. The density-distribution of winter flounder larvae at MNPS during 1996 and a calculation of the fraction of larvae entrained will be made based on data from the 1996 entrainment samples and actual cooling-water flow at MNPS. This information will be included in the forthcoming Annual Report, to be provided to the DEP on or before April 30, 1997, in accordance with the NPDES permit for MNPS.

REFERENCE

Northeast Utilities Service Company (NUSCO). 1996. Winter flounder studies. Pages 109-197
in Monitoring the marine environment of Long Island Sound at Millstone Nuclear Power Station,
Waterford, Connecticut. Annual report 1995.