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**December 10, 1999**

**NG 99-1732**

**U.S. Nuclear Regulatory Commission  
Attn: Document Control Desk  
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Washington, DC 20555-0001**

**Subject: Duane Arnold Energy Center  
Docket No: 50-331  
Operating License: DPR-49  
November 1999 Monthly Operating Report**  
**File: A-118d**

**Please find enclosed the Duane Arnold Energy Center Monthly Operating Report for November 1999. The report has been prepared in accordance with the guidelines of NRC Generic Letter 97-02: Revised Contents Of The Monthly Operating Report, and distribution has been made in accordance with DAEC Technical Specifications, Section 5.6.4.**

**Very truly yours,**

**Richard L. Anderson  
Plant Manager-Nuclear**

**RLA/RBW**

**Enclosures**

**PDR: A000 0000331**

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December 10, 1999  
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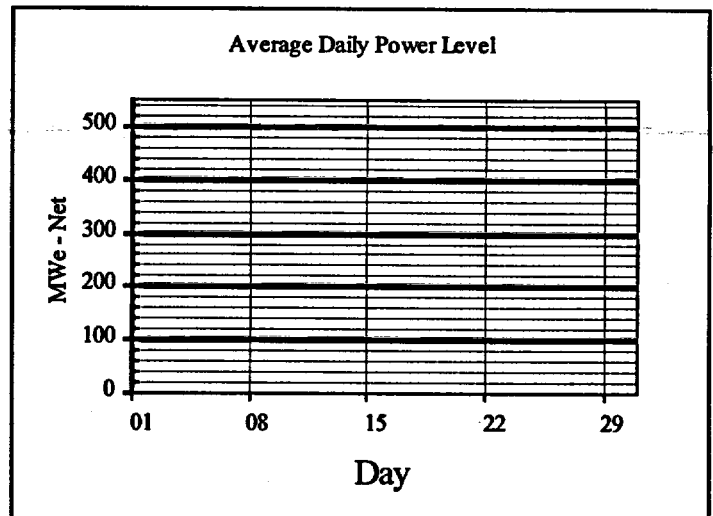
CTS Project

## OPERATING DATA REPORT

DOCKET NO: 50-331  
 DATE: 12/10/99  
 Unit: Duane Arnold Energy Center  
 COMPLETED BY: Richard Woodward  
 TELEPHONE: (319) 851-7318

### OPERATING STATUS

1. Unit Name: Duane Arnold Energy Center
2. Reporting Period: November 1999
3. Licensed Thermal Power ( $MW_{th}$ ): 1658
4. Nameplate Rating (Gross  $MW_e$  DER): 565.7 (Turbine)
5. Design Electrical Rating (Net  $MW_e$  DER): 538
6. Maximum Dependable Capacity (Gross  $MW_e$  MDC): 550
7. Maximum Dependable Capacity (Net  $MW_e$  MDC): 520
8. If Changes Occur in Capacity Ratings (Items Number 3 through 7) since the last report, Give Reasons: Not Applicable
9. Power Level to Which Restricted, If Any (Net  $MW_e$ ): Not Applicable
10. Reasons for Restrictions, If Any: End-of-Cycle Fuel Coastdown



	November-99	1999	Cumulative	
11.	Hours in Reporting Period	720.0	8,016.0	217,656.0
12.	Number of Hours Reactor Was Critical	47.7	6,644.7	168,993.5
13.	Reactor Reserve Shutdown Hours	0.0	0.0	192.8
14.	Hours Generator On-Line	0.3	6,524.6	165,152.8
15.	Unit Reserve Shutdown Hours	0.0	0.0	0.0
16.	Gross Thermal Energy Generated (MWH)	11,150.7	10,413,240.9	237,261,030.2
17.	Gross Electrical Energy Generated (MWH)	5.0	3,487,892.0	79,548,218.6
18.	Net Electrical Energy Generated (MWH)	0.8	3,290,715.0	74,700,960.5
19.	Unit Service Factor	0.0%	81.4%	75.9%
20.	Unit Availability Factor	0.0%	81.4%	75.9%
21.	Unit Capacity Factor (Using MDC Net)	0.0%	78.9%	72.2%
22.	Unit Capacity Factor (Using DER Net)	0.0%	76.3%	69.1%
23.	Unit Forced Outage Rate	0.0%	0.0%	9.1%

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of each): Refuel, 10/22/99, 40 days
25. If Shutdown at End of Report Period, Estimated Date of Startup: Refuel Outage Actual Startup: 12/01/99

AVERAGE DAILY UNIT POWER LEVEL

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MONTH November 1999

Day	Average Daily Power Level (MWe-Net)
1	0.0
2	0.0
3	0.0
4	0.0
5	0.0
6	0.0
7	0.0
8	0.0
9	0.0
10	0.0
11	0.0
12	0.0
13	0.0
14	0.0
15	0.0
16	0.0
17	0.0
18	0.0
19	0.0
20	0.0
21	0.0
22	0.0
23	0.0
24	0.0
25	0.0
26	0.0
27	0.0
28	0.0
29	0.0
30	0.0
31	#N/A

## REFUELING INFORMATION

DOCKET NO: 50-331  
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 Unit: Duane Arnold Energy Center  
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 TELEPHONE: (319) 851-7318

1. Name of facility. Duane Arnold Energy Center
2. Scheduled date for next refueling shutdown. May 1, 2001
3. Scheduled date for restart following refueling. June 6, 2001
4. Will refueling or resumption of operation thereafter require a technical specification change or other license amendment? No
5. Scheduled date(s) for submitting proposed licensing action and supporting information. Not applicable.
6. Important licensing considerations associated with refueling, e.g., new or different fuel design or supplier, unreviewed design or performance analysis methods, significant changes in fuel design, new operating procedures. Not applicable.
7. Current fuel assemblies inventory

	Number of Fuel Assemblies	Projected date of last refueling that can be discharged (after allowing margin for maintenance of continuous full-core discharge capability)
Installed into reactor core	368	N/A
Discharged from core to Spent Fuel Storage Pool	1776	N/A
Installed Capacity of Spent Fuel Storage Pool	2411	2001
Licensed Capacity of Spent Fuel Storage Pool (with reracking)	2829	2006
Licensed Capacity of Spent Fuel Storage Pool and Cask Pool (with reracking)	3152	2010

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**UNIT SHUTDOWNS AND POWER REDUCTIONS**  
**REPORT MONTH: November 1999**

No.	Date	Type (1)	Duration (Hours)	Reason (2)	Method of Shutting Down Reactor (3)	Licensee Event Report #	Cause
10	11/01/99 - (end of month)	S	743.75	C	4		Refuel Outage 16 (briefly connected to grid during the last 15 minutes of the month for turbine overspeed testing, 11/30/99 23:45 - 12/01/99 03:58)

<b>1 - F: Forced</b> <b>S: Scheduled</b>	<b>2 - Reason</b> A-Equipment Failure (Explain) B-Maintenance or Test C-Refueling D-Regulatory Restriction E-Operator Training & License Examination F-Administrative G-Operational Error (Explain) H-Other (Explain)	<b>3 - Method:</b> 1-Manual 2-Manual Scram 3-Automatic Scram 4-Continued 5-Reduced Load 9-Other (Explain)
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**Monthly Operational Overview for November 1999**

At the beginning of the month the DAEC was in the tenth day of Refuel Outage 16, which had begun October 22<sup>nd</sup>. Refueling Outage 16 work scope included replacement of 128 thrice-burned fuel assemblies, 165 surveillance tests, 155 in-service inspections, 1083 separate maintenance actions, and overhaul of the "B" Low Pressure Turbine.

In November, during the refuel outage, inspection of welds susceptible to intergranular stress corrosion cracking (IGSCC) via ultrasonic examination identified single IGSCC indications on both the B and D recirculation riser nozzle-to-safe end F002 welds and one weld flaw on the F riser F002 weld. Weld overlays using IGSCC-resistant Alloy 52 were completed on the B and D riser welds. Reinspection of the F riser weld showed that the flaw was subsurface with no connection to the inside or outside of the weld surface piping. Review of 1978/1979 radiographs and repair records confirmed that this was likely a small area of internal incomplete fusion between weld beads, and is not attributable to IGSCC. The weld was evaluated under the ASME Code and determined to be acceptable to leave as-is due to the size of the flaw and its lack of exposure to the surface. This event had no effect on the safe operation of the plant. (LER #99-006)

On November 27, following maintenance and local leak rate testing of the drywell airlock, the mode switch was placed in 'Startup/Hot Standby' and mode 2 was entered at 14:59. Control rod withdrawal commenced at 15:28, and criticality was reached at 17:31.

At 22:35, Safety Relief Valve PSV4402 opened while the electricians were troubleshooting a 125 VDC ground alarm. (The valve is controlled by 125VDC.) The troubleshooting was halted and the valve closed. This evolution caused the reactor vessel level to swell to approximately 200 inches above the top of active fuel while it was open and to drop to 178" when it first closed. Reactor pressure and level were quickly restored to normal. After review of the event, control rod withdrawal recommenced 09:10 on November 28<sup>th</sup>. At 11:11, during a surveillance test, PSV-4402 would not cycle open. It was declared inoperable and the appropriate LCOs were entered. The remaining relief valves tested satisfactorily. To make the necessary repairs, the reactor was manually scrammed at 14:22, and PSV 4402 troubleshooting began. (LER #99-007).

Following repairs on the 125VDC system which resolved the PSV4402 problem, and replacement of main turbine stop valve gaskets, the reactor was again taken critical November 29<sup>th</sup> at 21:12. The generator was briefly connected to the grid during turbine overspeed testing on November 30 from 23:45 until 03:58 on December 1<sup>st</sup>. RFO 16 officially ended when the generator was synchronized to the grid at 04:54 on December 1. Outage duration was 40 days 4 hours 39 minutes.

Total amount of time while critical during November was 47 hours 39 minutes, and the reactor produced 11,150.7 MWH<sub>th</sub>. DAEC produced 5.0 MWH<sub>e</sub> in November (during the first 15 minutes of the turbine overspeed on November 30). On-line house loads were 4.2 MWH<sub>e</sub>, so Net Electric Output (for November) was 0.8 MWH<sub>e</sub>.

**Licensing Action Summary:**

Plant Availability:	0.0%	Unplanned Auto Scrams (while/critical) this month:	0
Number of reportable events:	2	Unplanned Auto Scrams (while/critical) last 12 months:	0
		Main Steam Safety and Relief Valve Challenges:	0