



Duane Arnold Energy Center  
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January 15, 1997  
NG-97-0059

Mr. A. Bill Beach  
Regional Administrator  
Region III  
U.S. Nuclear Regulatory Commission  
801 Warrenville Road  
Lisle, IL 60532-4351

Subject: Duane Arnold Energy Center  
Docket No: 50-331  
Operating License: DPR-49  
December 1996 Monthly Operating Report  
File: A-118d

Dear Mr. Beach:

Please find enclosed the Duane Arnold Energy Center Monthly Operating Report for December 1996. The report has been prepared in accordance with the guidelines of NUREG-0020 and distribution has been made in accordance with DAEC Technical Specifications, Section 6.11.1.c.

Very truly yours,

A handwritten signature in cursive script that reads "Gary VanMiddlesworth".

Gary VanMiddlesworth  
Plant Manager-Nuclear

GDV/RBW

Enclosures

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Mr. A. Bill Beach  
NG-97-0059  
January 15, 1997  
Page 2 of 2

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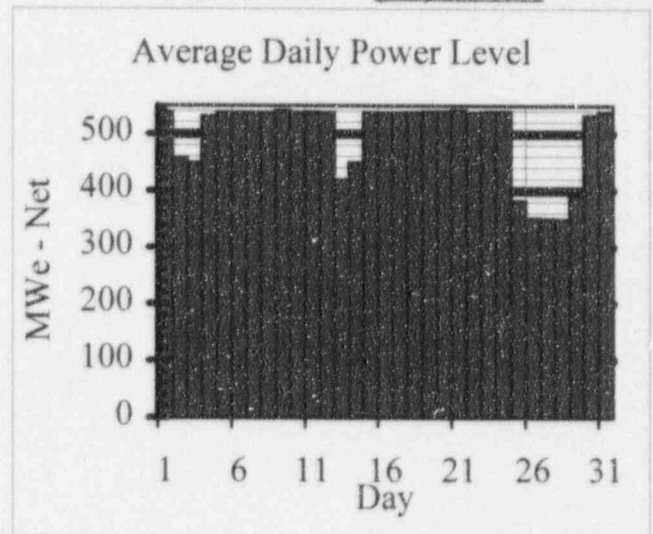
NRC Resident Inspector

# OPERATING DATA REPORT

DOCKET NO: 50-0331  
 DATE: 01/15/97  
 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: December 1996
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  $MW_e$ ): N/A
10. Reasons for Restrictions, If Any: N/A



		December-96	1996	Cummulative
11.	Hours in Reporting Period	744.0	8,784.0	192,120.0
12.	Number of Hours Reactor Was Critical	744.0	7,968.3	146,494.1
13.	Reactor Reserve Shutdown Hours	0.0	0.0	192.8
14.	Hours Generator On-Line	744.0	7,907.4	143,021.1
15.	Unit Reserve Shutdown Hours	0.0	0.0	0.0
16.	Gross Thermal Energy Generated (MWH)	1,148,370.2	12,391,896.7	201,653,111.1
17.	Gross Electrical Energy Generated (MWH)	392,890.0	4,177,076.0	67,589,046.6
18.	Net Electrical Energy Generated (MWH)	370,441.5	3,938,544.4	63,415,559.0
19.	Unit Service Factor	100.0%	90.0%	74.4%
20.	Unit Availability Factor	100.0%	90.0%	74.4%
21.	Unit Capacity Factor (Using MDC Net)	95.8%	86.2%	69.6%
22.	Unit Capacity Factor (Using DER Net)	92.5%	83.3%	66.6%
23.	Unit Forced Outage Rate	0.0%	0.0%	10.2%

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of each): Maintenance, January 11, 1997; four days
25. If Shutdown at End of Report Period, Estimated Date of Startup: N/A

# AVERAGE DAILY UNIT POWER LEVEL

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MONTH December 1996

Day	Average Daily Power Level (MWe-Net)
1	538.7
2	456.9
3	448.8
4	531.1
5	538.1
6	538.2
7	538.1
8	537.9
9	541.4
10	537.2
11	538.6
12	537.3
13	418.8
14	449.0
15	536.9
16	537.6
17	537.8
18	538.5
19	539.3
20	539.5
21	541.5
22	537.3
23	539.1
24	539.3
25	382.0
26	351.9
27	350.8
28	349.6
29	393.3
30	532.0
31	538.5

# REFUELING INFORMATION

DOCKET NO: 50-0331  
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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.**

March 1998

**3. Scheduled date for restart following refueling.**

April 1998

**4. Will refueling or resumption of operation thereafter require a technical specification change or other license amendment?**

N/A

**5. Scheduled date(s) for submitting proposed licensing action and supporting information.**

N/A

**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.**

N/A

**7. Current and projected 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 in reactor core (following refueling)	368	n/a
Discharged from core to Spent Fuel Storage Pool	1528	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: December 1996

No.	Date	Type (1)	Duration (Hours)	Reason (2)	Method of Shutting Down Reactor (3)	Licensee Event Report #	System Code (4)	Comp. Code (5)	Cause
13	December 2-3	F	0 (7.2 full- power hours equivalent)	A	5	n/a	AD Reactor Recirculation System	BKR Breaker	Loss of 'A' Recirc Pump caused by post maintenance testing on breaker
14	December 13-14	F	0 (2.5 full- power hours equivalent)	A	5	n/a	SJ Feedwater System	FCV Flow Control Valve	Spiking of flow through the 'A' Feedwater Regulating Valve
15	December 25-29	F	0 (35.6 full- power hours equivalent)	B	5	n/a	AD Reactor Recirculation System	MG Motor Generator Set	Broken slip ring connector caused 'A' Reactor Recirculation Pump MG Set to trip

1 - F: Forced  
S: Scheduled

2 - Reason  
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)

3 - Method:  
1-Manual  
2-Manual Scram  
3-Automatic Scram  
4-Continued  
5-Reduced Load  
9-Other (Explain)

4 - Exhibit G- Instructions for  
Preparation of Data Entry  
Sheets for Licensee Event  
Report (LER) File (NUREG-  
0161)

5 - Exhibit 1 (Same Source)



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#### Monthly Operational Overview for December 1996:

At the beginning of the month the DAEC was operating at 100% of Licensed Thermal Power, 15 days into Operating Cycle Fifteen, having completed Refuel Outage Fourteen on November 16, 1996.

At 1530 on December 2, during post maintenance testing the Crosstie Breaker between the Turbine Building 480V AC Load Centers failed to close and all loads on the '1B5' Load Center were lost and immediately reenergized. This resulted in a subsequent loss of the 'A' Recirculation Pump. Power initially dropped to 68%. At approximately 2345 the 'A' pump was brought back to service, and the plant returned to licensed thermal power December 3 after holding for Xenon equilibrium.

At 1306 December 13, the plant lowered power to approximately 50% in order to secure the 'A' Feedwater pump and to perform maintenance due to spiking of flow indication through the 'A' Feedwater Regulating Valve. Technicians tightened a loosened connector on the positioner of the regulating valve, replaced a cracked air fitting, and replaced a booster assembly. The 'A' Reactor Feed Pump was returned to service early December 14 and the plant returned to 100% power that afternoon. Turbine testing and walkdowns were completed during the downpower.

On December 15 Reactor power was twice temporarily lowered to 95% to withdraw control rods and increase load line.

The 'A' Reactor Recirculation Pump MG Set tripped at 0449 on December 25. The plant responded as expected and stabilized at 65% power. The combination of the prevailing cold weather (-4°F) and reduction in power level required the shutting off of 16 (of the 24) cooling tower fans to accomplish de-icing of the towers. The source of the 'A' Recirculation MG set trip was found to be a broken slip ring connector. Return to full power was delayed to ensure verification of the cause of the trip. Repairs were completed by 2200 on December 28, and the 'A' Recirculation pump was returned to service by early December 29. The plant returned to 100% power by 2000 December 29.

Recirculation flow was briefly decreased to reduce power at noon December 30 and 0800 December 31 to withdraw control rods and increase reactor load line.

Allocation of Production & Losses:	Electrical Output MWe	Capacity Factor % of 565.7 MWe (Design Gross Rating)	Full Power Equivalent Hours
Actual Metered Net Electric Output	497.9	88.1%	654.8
Actual Metered Plant Electric Loads	30.2	5.3%	39.7
Excluded losses: (Load Following or Coast Down):	0.0	0.0%	0.0
Off-Line	0.0	0.0%	0.0
Unplanned On-Line Capacity Losses: Two Recirc Pump Trips -- 12/25-29 & 12/2-3, Spiking on "A" Feedwater Regulating Valve CV1579 --12/13-14	34.6	6.1%	45.3
(Negative) Weather losses, i.e., gains -- condenser pressure <2.75 in Hg / Circ Water Temp < 74.5 °F	-3.1	-0.5%	-4.1
Planned On-Line Capacity Losses: Turbine Valve Testing 12/13-14, Withdraw control rods 12, 5, 18, 30, and 31	4.8	0.8%	6.3
Normal Capacity Losses (Avg MWth < 1658)	0.3	0.0%	0.4
Metering Losses (Avg indic MWe - Avg MWHe)	2.5	0.4%	3.3
(Negative) Efficiency Losses, i.e., gains: Weather-Norm-Full-Power-MWe > 565.7 Design	-1.3	-0.2%	-1.7
<b>Design Gross Electric Output</b>	<b>565.7</b>	<b>100.0%</b>	<b>744.0</b>

On December 3, as-found testing was completed by Wyle Labs for the Main Steam Relief Valves (MSRVs) and Main Steam Safety Valves (MSSVs) removed during Refueling Outage 14 (October 11 - November 16, 1996). Five of the eight valves failed to meet the setpoint requirements of Technical Specification Limiting Safety System Setting (TSLSSS). All MSRVs and MSSVs were restored to within their TSLSSS. The overall system performance as-found would have ensured that no vessel over-pressurization could have occurred. (LER #96-007, for information.)

#### Licensing Action Summary:

Plant Availability: 100.0%      Unplanned Auto Scrams (while/critical) this month: 0  
 Number of reportable events: 0      Unplanned Auto Scrams (while/critical) last 12 months: 0