



Duane Arnold Energy Center  
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March 13, 1998

NG 98-0398

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  
February 1998 Monthly Operating Report  
File: A-118d

Dear Mr. Beach:

Please find enclosed the Duane Arnold Energy Center Monthly Operating Report for February 1998. 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 6.11.1.c.

Very truly yours,

A handwritten signature in cursive script, reading "Gary VanMiddlesworth".

Gary VanMiddlesworth  
Plant Manager-Nuclear

GDV/RBW

Enclosures

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Mr. A. Bill Beach  
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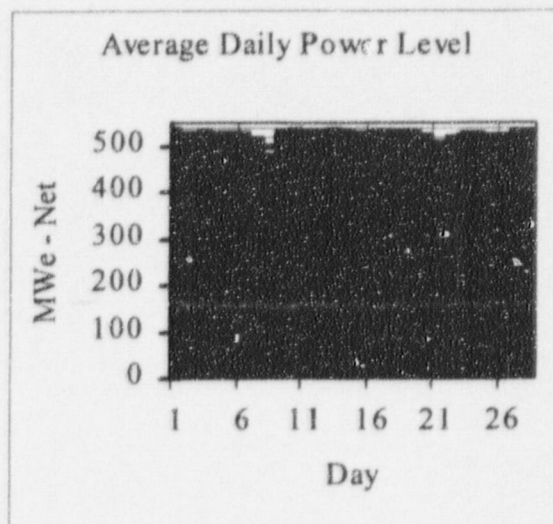
NRC Resident Inspector

# OPERATING DATA REPORT

DOCKET NO: 50-0331  
 DATE: 03/13/98  
 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: February 1998
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



		February-98	1998	Cumulative
11.	Hours in Reporting Period	672.0	1,416.0	202,296.0
12.	Number of Hours Reactor Was Critical	672.0	1,416.0	156,182.5
13.	Reactor Reserve Shutdown Hours	0.0	0.0	192.8
14.	Hours Generator On-Line	672.0	1,416.0	152,565.1
15.	Unit Reserve Shutdown Hours	0.0	0.0	0.0
16.	Gross Thermal Energy Generated (MWH)	1,104,688.8	2,332,005.6	217,038,047.8
17.	Gross Electrical Energy Generated (MWH)	376,694.0	796,446.0	72,789,132.6
18.	Net Electrical Energy Generated (MWH)	355,584.9	752,016.5	68,323,104.7
19.	Unit Service Factor	100.0%	100.0%	75.4%
20.	Unit Availability Factor	100.0%	100.0%	75.4%
21.	Unit Capacity Factor (Using MDC Net)	101.8%	102.1%	71.1%
22.	Unit Capacity Factor (Using DER Net)	98.4%	98.7%	68.1%
23.	Unit Forced Outage Rate	0.0%	0.0%	9.7%

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of each): Refueling, April 2, 1998, 45 days
25. If Shutdown at End of Report Period, Estimated Date of Startup: N/A



# AVERAGE DAILY UNIT POWER LEVEL

DOCKET NO: 50-0331

DATE: 03/13/98

Unit: Duane Arnold Energy Center

COMPLETED BY: Richard Woodward

TELEPHONE: (319) 851-7318

MONTH February 1998

Day	Average Daily Power Level (MWe-Net)
1	530.6
2	531.1
3	533.5
4	530.4
5	531.8
6	530.7
7	519.9
8	484.1
9	534.8
10	536.4
11	533.5
12	534.8
13	537.3
14	535.6
15	529.1
16	535.9
17	532.8
18	534.0
19	533.2
20	527.2
21	512.3
22	522.4
23	530.8
24	532.0
25	526.3
26	527.3
27	533.0
28	535.4

## REFUELING INFORMATION

DOCKET NO: 50-0331  
 DATE: 03/13/98  
 Unit: Duane Arnold Energy Center  
 COMPLETED BY: Richard Woodward  
 TELEPHONE: (319) 851-7318

1. **Name of facility.** Duane Arnold Energy Center
2. **Scheduled date for next refueling shutdown.** April 2, 1998
3. **Scheduled date for restart following refueling.** May 17, 1998
4. **Will refueling or resumption of operation thereafter require a technical specification change or other license amendment?** Yes

RTS 296 proposes fuel discharge as early as 60 hours after shutdown (versus current 120 hour requirement).  
 RTS 298 proposes reducing restrictions for Standby Liquid Control System Operability requirements.  
 RTS 299 proposes allowing performance of Reactor Vessel Hydro without changing reactor mode.

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

RTS 296, "Refueling Operations" submitted October 3, 1997.  
 RTS 298, "Standby Liquid Control Operability Requirements" submitted February 3, 1998.  
 RTS 299, "Vessel Hydrostatic Pressure and Leak Testing Operability Requirements", submitted February 3, 1998.

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	368	n/a
Fresh fuel to be installed into the core during April 1998 refueling	120	n/a
Previously discharged from core to Spent Fuel Storage Pool	1528	n/a
Discharged from core to Spent Fuel Storage Pool following April 1998 refueling	1648	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: February 1998							
(There were no power reductions >20% during the month.)							
No.	Date	Type (1)	Duration (Hours)	Reason (2)	Method of Shutting Down Reactor (3)	Licensee Event Report #	Cause

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)



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### Monthly Operational Overview for February 1998

During the month of February the DAEC averaged 99.1% capacity, operating at or near its 1658 MW<sub>th</sub> full-thermal-power licensed limit, except for the following capacity losses:

- 02/01 15:15 - 16:50, reduced recirculation flow to pull control rods and increase load-line (rod-pull), 0.09 FPH<sub>eq</sub>
- 02/03 20:28 - 02/04 03:04, maintenance on the Plant Process Computer (PPC) system, 0.09 FPH<sub>eq</sub> (unplanned)
- 02/04 03:04 - 02/07 21:05, to maintain margin to thermal limits while deferring scheduled sequence exchange to coincide with planned weekend downpower (thermal power declined from 1648 to 1632 MW<sub>th</sub>), 0.56 FPH<sub>eq</sub>
- 02/07 21:05 - 02/08 10:00, sequence exchange, turbine control valve testing, 2.50 FPH<sub>eq</sub>
- 02/09 23:30 - 02/10 00:22, rod-pull, 0.05 FPH<sub>eq</sub>
- 02/11 10:15 - 13:00, High Pressure Coolant Injection (HPCI) quarterly operability testing, 0.08 FPH<sub>eq</sub>
- 02/13 17:40 - 17:56, post-maintenance HPCI testing, 0.01 FPH<sub>eq</sub> (unplanned)
- 02/19 23:30 - 02/20 01:22, rod-pull, 0.27 FPH<sub>eq</sub>
- 02/21 19:02 - 02/22 09:38, to insert rod 26-39 full-in for maintenance, and to hold for Xenon transient to move power, 0.85 FPH<sub>eq</sub> (unplanned)
- 02/24 12:30 - 14:05, reduced to 98% thermal power for PPC troubleshooting after receiving numerous (spurious) Average Power Range Monitor (APRM) computer comparison alarms, 0.03 FPH<sub>eq</sub> (unplanned)
- 02/26 22:30 - 23:29, rod-pull, 0.06 FPH<sub>eq</sub>

Also during the month the DAEC incurred the following unplanned efficiency losses:

- 02/01 - 02/04 12:00, continuation of 3MW<sub>e</sub> efficiency loss (stuck first stage moisture separator reheater drain tank level controller) which had begun January 23, 0.40 FPH<sub>eq</sub>
- 02/13 - 02/28, average 2½ MW<sub>e</sub> loss resulting from fouling of the feedwater flow measurement nozzle, effectively reducing *actual* "full" thermal power from *as-indicated* 1658 MW<sub>th</sub> (the licensee limit) to 1650, 1.47 FPH<sub>eq</sub>

Weather-related *gains* (seasonal boosts in plant output related to winter-time condenser inlet temperatures, accounted for as *negative* losses) offset 3.2 FPH<sub>eq</sub> of these losses. Within-tolerance measurement discrepancy between *indicated power* and *metered energy*, 0.4% (accounted for as an efficiency loss), takes up the residual. Total losses (netting in the weather-related *gains* in plant output) equaled 6.2 FPH<sub>eq</sub> out of the available 672 clock-hours during the month.

At the end of February the DAEC had continuously operated 168 consecutive days.

Allocation of Production & Losses:	Electrical Output MWe	Capacity Factor % of 565.7 MWe (Design Rating)	Full Power Equivalent Hours (FPH <sub>eq</sub> )
Actual Metered Net Electric Output	529.1	93.5%	628.5
Actual Metered Plant Electric Loads	31.4	5.6%	37.3
Off-Line Capacity Losses:	0.0	0.0%	0.0
On-Line Unplanned Capacity Losses:	1.3	0.2%	1.5
Normal Capacity Losses (Avg. "Full Power" MW <sub>th</sub> < 1658)	0.4	0.1%	0.5
On-Line Planned Capacity Losses	2.3	0.4%	2.7
(neg.) Weather losses -- condenser pressure < 2.75 in Hg / Circ Water Temp < 74.5 °F	-2.7	-0.5%	-3.2
Unplanned Efficiency Losses (Weather-Norm-Full-Power-MWe > 565.7 Design)	1.5	0.3%	1.8
Metering (Avg indicated power MWe - Avg metered energy MWe)	2.4	0.4%	2.9
Excluded losses (coast-down, lack of grid demand, etc.)	0.0	0.0%	0.0
<b>Design Gross Electric Output</b>	<b>565.7</b>	<b>100.0%</b>	<b>672.0</b>

(There were no Licensee Event Reports.)

#### 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
		Safety Relief Valve Challenges:	0