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Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324-9785

Operated by Nuclear Management Company, LLC

September 13, 2002

NG-02-0834

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
August 2002 Monthly Operating Report
File: A-118d

Please find enclosed the Duane Arnold Energy Center Monthly Operating Report. 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,

9/12/02

John Bjorseth
Plant Manager-Nuclear

JKB/RBW

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IE24

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CTS Project

OPERATING DATA REPORT

DOCKET NO: 50-331
DATE: 09-13-2002
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: August 2002

3. Licensed Thermal Power (MW_{th}): 1912
Tech Spec. Amendment 243 and TSCR for extended power uprate was implemented November 7, 2001. Current operating thermal power, as limited by balance-of-plant equipment, is 1790

4. Nameplate Rating (Gross MW_e DER): 676.425
Current rated output, adjusted for as-built balance-of-plant conditions is 614 0

5. Design Electrical Rating (Net MW_e DER): 581.4

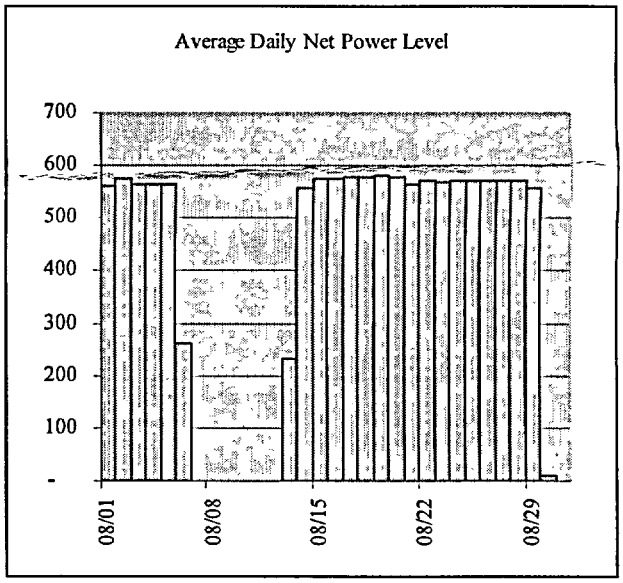
6. Maximum Dependable Capacity (Gross MW_e MDC): 593.1

7. Maximum Dependable Capacity (Net MW_e MDC): 565.5

8. If Changes Occur in Capacity Ratings (Items Number 3 through 7) since the last report, give reasons: N/A

9. Power Level to Which Restricted, If Any (Net MW_e): N/A

10. Reasons for Restrictions, If Any: N/A



		Aug-02	2002	Cumulative
11.	Hours in Reporting Period	744.0	5,831.0	241,775.0
12.	Number of Hours Reactor Was Critical	576.9	5,480.6	191,461 2
13.	Reactor Reserve Shutdown Hours	0.0	0.0	192.8
14.	Hours Generator On-Line	553.1	5,415.9	187,340.8
15.	Unit Reserve Shutdown Hours	0.0	0.0	0.0
16.	Gross Thermal Energy Generated (MWH)	946,401.9	9,486,023.4	273,984,653.2
17.	Gross Electrical Energy Generated (MWH)	317,180.0	3,236,291.0	91,970,508 6
18.	Net Electrical Energy Generated (MWH)	299,676 4	3,063,404.3	86,439,030.3
19.	Unit Service Factor	74.3%	92.9%	77.5%
20.	Unit Availability Factor	74.0%	92.9%	77.5%
21.	Unit Capacity Factor (Using MDC Net)	71.2%	93.3%	69.7%
22.	Unit Capacity Factor (Using DER Net)	69.3%	90.7%	67.3%
23.	Unit Forced Outage Rate	0.0%	0.0%	8.3%

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of each): N/A

25. If Shutdown at End of Report Period, Estimated Date of Startup: Startup occurred September 9.

AVERAGE DAILY UNIT POWER LEVEL

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MONTH August 2002

Day	Average Daily Power Level (MWe-Net)
1	561
2	575
3	565
4	563
5	562
6	262
7	0
8	0
9	0
10	0
11	0
12	0
13	233
14	556
15	573
16	575
17	578
18	576
19	580
20	577
21	565
22	570
23	568
24	571
25	571
26	572
27	571
28	572
29	556
30	12
31	0

REFUELING INFORMATION

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1. **Name of facility.** Duane Arnold Energy Center

2. **Scheduled date for next refueling shutdown.** Spring 2003

3. **Scheduled date for restart following refueling.** Spring 2003

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.** 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 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	
Discharged from core to Spent Fuel Storage Pool	1912	
Scheduled for transfer to Dry Fuel Storage November 2003	610	
Installed capacity of Spent Fuel Storage Pool	2411	2008
Licensed capacity of Spent Fuel Storage Pool (with re-racking)	2829	2014
Licensed capacity of Spent Fuel Storage Pool and Cask Pool (with reracking)	3152	

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UNIT SHUTDOWNS AND POWER REDUCTIONS
REPORT MONTH: August 2002

No.	Date	Type (1)	Duration (Hours)	Reason (2)	Method of Shutting Down Reactor (3)	Licensee Event Report #	Cause
7	8/06 – 12/2002	F[1]	148.77 (171.36 Effective-Full-Power-Hours)	B	1	2002-002	Excessive algae accumulation caused plugging of RHRSW strainers, causing both subsystems to be declared inoperable [1] not deferred until the "weekend following discovery of the off-abnormal condition" (GL97-02) The shutdown was in response to unprecedented "accumulation of marine debris and biological contaminants", i e , "not forced" (Unplanned Power Changes > 20% NEI 99-02 NRC Performance Indicators)
8	08/30 – (end of month)	S	42.10 (47.53 Effective-Full-Power-Hours)	B	1		Identify and repair source of drywell leakage

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 August 2002

At the beginning of August, the DAEC had continuously operated sixty-eight days.

On August 1st at 12:29, operators reduced power from 1790 to 1676 MWth after main condenser back pressure increased due to high wet-bulb temperatures while one cooling tower cell was out-of-service. At 16:40, following a drop in ambient temperature, the condenser backpressure decreased, and full power was restored.

On August 4th and 5th, the "B" and "A" RHRSW (Residual Heat Removal Service Water) subsystems had been declared inoperable due to high strainer differential pressure. The loss of both sub-systems ultimately required a plant shutdown, which occurred with the generator taken off-line August 6 at 16:59 and with insertion of a manual scram at 17:09. The cause of the high strainer differential pressure was found to be excessive algae at the intake structure and the RHRSW and ESW (Emergency Service Water) wet pits. Analysis of the algae concluded that it was of similar type to that found in the ESW pit in September 2001, however the extent of the accumulation was unprecedented in the 28-year history of the DAEC, and industrial facilities up and down the Cedar River were similarly affected. The wet pits, the pump house stilling basin, the river water supply pits at the intake structure, and the RHRSW strainers were all cleaned and inspected, and the water chemically treated to control the plant growth that could plug the RHRSW strainers. Acceptable pump operation was demonstrated, and an evaluation determined that use of the RHRSW strainer bypass was acceptable. Based on these findings, the RHRSW systems were retroactively determined to have been operable throughout the event. Following the measures taken to ensure RHRSW operability, reactor startup commenced August 11th at 12:47, the reactor was taken critical at 01:04 on August 12th, and the generator synchronized to the grid at 21:45 August 12th. Full power was achieved August 14th at 10:33. (LER #2002-002, pending.)

On August 21, during post-maintenance RCIC (Reactor Core Isolation Cooling) system operability testing, following planned repair of RCIC relief valves, a Low Oil Pressure alarm was received immediately upon RCIC start. RCIC was secured, and declared inoperable. Oil was added, and RCIC was then restarted. Upon restart, an oil leak appeared, and RCIC was secured again. It was determined that entrapped air in the lube oil system resulted in the leak. System piping and orifices were inspected, and a vent cap was installed on the outboard turbine bearing housing, but subsequent operation of the RCIC turbine revealed that the lube oil problem still had not been corrected. Troubleshooting continued during the (unrelated) plant shutdown that occurred August 30th. (RCIC narrative continues after next paragraph.)

Drywell coolers had been exhibiting an increasing rate of leakage since August 20th, and on August 29th at 21:32, an orderly shutdown commenced to perform repairs. On August 30th, the DAEC was taken off-line at 05:57, and a manual scram was inserted at 08.56. At that time, the "unidentified" drywell leakage rate (which includes the drywell coolers) was 1.98 GPM, and identified leak age was 1.52 GPM. (The DAEC Technical Specification Limit for drywell leakage is 5 GPM unidentified, 25 GPM total, and 2 GPM increase within previous 24 hours.) The timing of the shutdown was set to coincide with a window of reduced grid demand during the long holiday weekend. Startup following the repair commenced at 10:59 September 1st and the reactor was taken critical at 12:35 September 1st.

On September 2 at 21:00, continued RCIC lube oil problems required the startup to be terminated without the generator ever having been synchronized to the grid. A manual scram was inserted at 22:05, commencing an unplanned extension of the planned drywell leakage shutdown. This will be further discussed in next month's report. (LER #2002 – 003, pending.)

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Following is the allocation of production and losses:	Electrical Output MWe	Capacity Factor % of 614 MWe (Target Output)	Full Power Hours Equivalent (FPHeq)
Net Electric Output	**402.78**	**65.60%**	**488.07**
Plant House Loads (while on-line)	**+23.52**	**+3.83%**	**28.51**
Subtotal: Gross Electric Output	**426.30**	**69.43%**	**516.58**
Capacity Losses (departures from full thermal power):			
High condenser back pressure 08/01 12:29 16:40	0.26	0.04%	0.32
CRD Adjustments 08/14 12:25 - 13:20 & 19:05 - 19:55, 08/15 04:42 - 05:05 & 20:45 - 21:35	0.04	0.01%	0.05
Unplanned repairs CV1129 - 1E4A FWH dump	3.00	0.49%	3.63
Ramp-down 08/06 07:53 - 16:59 & 8/29 21:32 - 08/30 05:51 & ramp-up 08/12 21:45 - 0814 10:33	19.71	3.21%	23.88
Maintain Margin to 1790 Administrative MWth Limit	0.21	0.03%	0.26
Efficiency Losses (occur even at full thermal power):			
Unidentified (residual)	0.30	0.05%	0.31
-/+ Seasonal Effects (i.e., hot weather decrease)	6.63	1.08%	8.05
Subtotal: On-line Losses (Capacity, Efficiency, and Weather):	**30.15**	**4.91%**	**36.50**
Off-Line Losses environmental: 08/06 16:59 - 08/12 21:45 (148.77 hrs); 08/30 05:51 - end of month (42.10 hrs)	**157.55**	**25.66%**	**190.92**
Total: Target Electric Output, %, # of clock-hours	**614.00**	**100.00%**	**744.00**

Licensing Action Summary:

Plant Availability:	74%	Unplanned Auto Scrams (while critical) this month:	0
Number of reportable events:	1	Unplanned Auto Scrams (while critical) last 12 months:	0
		Main Steam Safety/Relief Valve Challenges this month:	0