



Duane Arnold Energy Center
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November 15, 1996
NG-96-2447

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
October 1996 Monthly Operating Report
File: A-118d

Dear Mr. Beach:

Please find enclosed the Duane Arnold Energy Center Monthly Operating Report for October 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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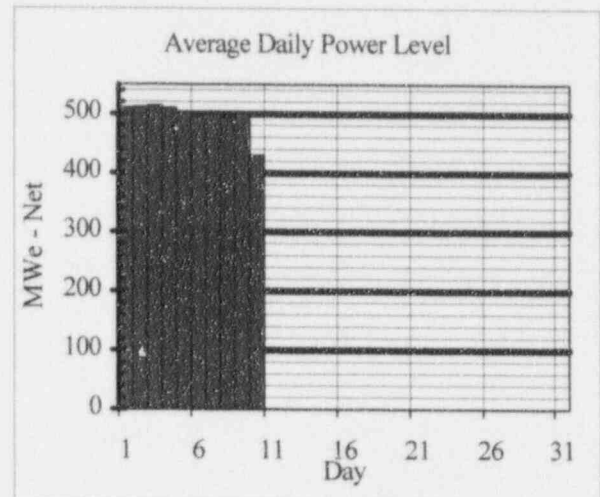
NRC Resident Inspector

OPERATING DATA REPORT

DOCKET NO: 50-0331
 DATE: 11/15/96
 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: October 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): Coast down from 97% (October 1) to 93% (October 10)
10. Reasons for Restrictions, If Any: End of fuel cycle reduction in full thermal power capability



		October-96	1996	Cummulative
11.	Hours in Reporting Period	745.0	7,320.0	190,656.0
12.	Number of Hours Reactor Was Critical	258.4	6,833.4	145,359.2
13.	Reactor Reserve Shutdown Hours	0.0	0.0	192.8
14.	Hours Generator On-Line	248.7	6,823.7	141,937.5
15.	Unit Reserve Shutdown Hours	0.0	0.0	0.0
16.	Gross Thermal Energy Generated (MWH)	379,411.7	10,819,084.1	200,080,298.5
17.	Gross Electrical Energy Generated (MWH)	127,320.0	3,644,889.0	67,056,859.6
18.	Net Electrical Energy Generated (MWH)	119,585.5	3,437,653.0	62,914,667.6
19.	Unit Service Factor	33.4%	93.2%	74.4%
20.	Unit Availability Factor	33.4%	93.2%	74.4%
21.	Unit Capacity Factor (Using MDC Net)	30.9%	90.3%	69.6%
22.	Unit Capacity Factor (Using DER Net)	29.8%	87.3%	66.6%
23.	Unit Forced Outage Rate	0.0%	0.0%	10.3%

24. Shutdowns Scheduled Over Next 6 Months (Type, Date, and Duration of each): Refueling Outage 14, commenced 10/11/96, planned duration: 36 days
25. If Shutdown at End of Report Period, Estimated Date of Startup: November 16, 1996

AVERAGE DAILY UNIT POWER LEVEL

DOCKET NO: 50-0331

DATE: 11/15/96

Unit: Duane Arnold Energy Center

COMPLETED BY: Richard Woodward

TELEPHONE: (319) 851-7318

MONTH October 1996

Day	Average Daily Power Level (MWe-Net)
1	510.4
2	511.5
3	513.4
4	510.0
5	503.6
6	497.2
7	500.1
8	494.6
9	501.8
10	429.8
11	0.3
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	0.0

REFUELING INFORMATION

DOCKET NO: 50-0331
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1. Name of facility.

Duane Arnold Energy Center

2. Scheduled date for next refueling shutdown.

Refuel Outage 14 (began) October 11, 1996.

3. Scheduled date for restart following refueling.

November 16, 1996

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: October 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
12	October 11- 31	S	496.3	C	2	n/a	n/a	n/a	Refueling Outage

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 I (Same Source)

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Monthly Operational Overview for October 1996:

At the beginning of the month, the DAEC was operating at 97% of rated thermal power, six days into its end-of-cycle coast-down. Apart from the coast-down, the DAEC operated at its maximum available power until commencing a controlled shutdown October 10 from 94% power. DAEC began Refueling Outage 14 on Friday, October 11 at 0841 when the turbine generator was taken off line. All rods had been inserted by 1426 on the same day.

At the end of Cycle 14 the Duane Arnold Energy Center had operated 493 consecutive days, its best-ever continuous operating run and fourth best ever among all Boiling Water Reactors.

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	157.2	27.9%	207.0
Actual Metered Plant Electric Loads	13.7	2.4%	18.0
Excluded losses: (Load Following or Coast Down): 10/1-10/11-- Coast-down	8.4	1.5%	11.0
Off-Line 10/11/96 0841 - end of month	376.9	66.6%	496.4
Weather losses, ie., condenser pressure >2.75 in Hg / Circ Water Temp > 74.5 °F	0.2	0.0%	0.3
Planned Capacity Losses: Ramp-down 10/10 - 11	7.9	1.4%	10.4
Unplanned Capacity Losses	0.0	0.0%	0.0
Normal Capacity Losses (Avg MWth < 1658)	0.1	0.0%	0.2
Metering Losses (Avg indic MWe - Avg MWHe)	0.6	0.1%	0.8
Efficiency Losses (Weather-Norm-Full-Power-MWe < 565.7)	0.7	0.1%	0.9
Design Gross Electric Output	565.7	100.0%	745.0

Refueling Outage 14 will end in mid-November. As of November 1, core reload (120 new fuel assemblies) and replacement of six Local Power Range Monitor strings had been completed, as well as an enhanced visual inspection (IVVI) of Core Spray piping in the reactor vessel, and ultrasonic and visual exams of reactor vessel welds. Corrective and preventive maintenance on "B" side safety systems had also been finished, with work on the "A" side systems in progress. A number of modification packages were nearing completion, involving items such as increased Hydrogen Injection, Noble Metals Chemical Addition, improved feedwater control, and 10 CFR 50 App. R enhancements.

On October 8, 1996, with the plant operating at 93% power, two technicians inadvertently caused a Primary Containment Isolation System (PCIS) closure of the High Pressure Coolant Injection (HPCI) outboard steam supply isolation valve. The valve closure resulted from a misplaced relay contact block which would have prevented the isolation during the calibration of a HPCI Steam Flow Indicating Switch. In response to this event, the front of the relays were labeled to indicate contact locations. Management conducted meetings with all plant maintenance personnel reinforcing the expectations for self-checking, independent verification, and dual verification. Plant I&C personnel received additional briefings that included practical exercises on the simulator. (LER #96-004)

On October 20, 1996, two spurious PCIS isolations occurred. They resulted in a secondary containment isolation, loss of drywell ventilation, isolation of various containment and reactor coolant sample valves, and isolation of the Reactor Water Cleanup system. The cause of the isolations is believed to be a voltage transient on a temporary power connection supplying Instrument AC. The transient resulted in a brief voltage drop that caused a momentary loss of power to the Reactor Building Exhaust Radiation Monitor, the Reactor Water Cleanup instrument panel and various other instruments. All automatic actions occurred as designed on equipment that was not removed from

service for maintenance. In response to this event, a temporary power cart that was connected to the breaker was removed. (LER #96-005 -- pending)

On October 26, 1996, six inoperable Local Power Range Monitor (LPRM) strings were discovered in a configuration which caused the Average Power Range Monitor (APRM) circuit to include the inoperable LPRMs into its averaging of inputs. The final effect of this configuration is to cause the indicated APRM neutron power level to be less than actual neutron power level (i.e., non-conservative). The condition of having indicated power less than actual impaired the APRM 15% High Flux Scram function and would have caused the scram function to occur later than required.

The plant was in the Refuel Mode with fuel shuffling in progress. Technical Specifications require the APRM 15% High Flux Scram function to be operable whenever the reactor is in REFUEL or STARTUP and HOT STANDBY Mode. Technical Specifications also require suspension of all operations involving CORE ALTERATION and insertion of all insertable control rods within one hour of the APRM 15% Neutron High Flux Trip becoming inoperable. The requirements were not met because fuel shuffling had begun at 0558 on October 25 (the prior day). Upon discovery, the Operations Shift Supervisor immediately stopped the fuel shuffling and verified that all control rods were fully inserted. Finally, at 0020 on October 27, 1996, it was discovered that at least one inoperable APRM channel had not been placed in the tripped condition within one hour as required by Technical Specifications. All six APRM channels were discovered to be inoperable, but none had been placed in the tripped condition. When the disconnected LPRMs were later bypassed, all six APRMs were found to be operable.

Following the event, an engineering evaluation was performed to quantify the plant effects of leaving the APRM select switches in "Operate" for inoperative LPRMs. Operations placed the affected twenty-four LPRM switches in "Bypass" with "CAUTION" tags on them. The Prerequisite Checklist of the Core Alteration procedure was performed again to ensure all other requirements were met. All other LPRMs were determined to be operable since no maintenance was performed on them. Longer term corrective actions will include revising the procedures and work control documents to ensure the LPRM mode selector switch is placed in "Bypass" prior to disconnecting the LPRMs. (LER # 96-006 -- pending)

Licensing Action Summary:

Plant Availability:	33.4%	Unplanned Auto Scrams (while/critical) this month:	0
Number of reportable events:	3	Unplanned Auto Scrams (while/critical) last 12 months:	0