DACUM Research Chart for Power Plant Operating Technician

DACUM Panel

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Duties	Tasks				
A Monitor Power Plant System	A-1 Adhere to OSHA regulations	A-2 Maintain awareness of operating environment (sounds, smell, look, and feel)	A-3 Verify system alignment	A-4 Monitor system parameters	A-5 Read gauges
B Treat Water	B-1 Ensure control system is operating properly	B-2 Conduct water sample test	B-3 Backwash filters (charcoal and/or sand)	B-4 Regenerate demineralizer train	B-5 Monitor & control flows
C Maintain Condensate System	C-1 Maintain condensate quality within parameters	C-2 Check feedwater heaters	C-3 Monitor hotwell level and temperature	C-4 Check condensate system pumps	C-5 Check condensate system manual valves
D Maintain Feedwater System	D-1 Maintain feedwater quality within parameters	D-2 Check feedwater heaters	D-3 Check feedwater system pumps	D-4 Check feedwater system manual valves	D-5 Maintain minimum flows
E Maintain Steam System	E-1 Maintain steam quality within parameters	E-2 Check pressures & temperatures	E-3 Check safety valves	E-4 Check boiler drum vents	E-5 Check super heater vents & drains
F Maintain Fuel Storage and Delivery Systems	F-1 Check feeders	F-2 Check conveyor belting	F-3 Check protective devices	F-4 Check drag chains	F-5 Monitor fuel sizing
G Maintain Turbine System	G-1 Monitor lube oil & control oil	G-2 Monitor electric hydraulic control system	G-3 Check scavaging (air removal) system	G-4 Check steam seal system	G-5 Check for vibration
H Maintain Ash Removal Systems	H-1 Check ash removal system pumps	H-2 Check jet pumps	H-3 Check line pressures	H-4 Check ash removal system flows	H-5 Run & check RAMS
	H-13 Check baghouses (DPs & Pulse Pressure)	H-14 Check screw cooler speed	H-15 Check screw cooler temperatures	H-16 Check dump valves	H-17 Check dump gates
I Maintain Fuel Processing System	I-1 Check fuel sizing	I-2 Check monitor coal piping	I-3 Check crushers	I-4 Check burner tilts	I-5 Check steam suppression
	I-13 Check fuel nozzles	I-14 Check primary air	I-15 Check startup liquid propane gas (LPG)	I-16 Clean startup burner nozzles	I-17 Check vaporizer
J Maintain Scrubber System	J-1 Check scrubber system pumps	J-2 Check scrubber sootblowers	J-3 Check reheat differential pressure & temperatures	J-4 Check scrubber system flows	J-5 Check induced draft fan

A-6 Record results	A-7 Interpret results of readings	A-8 Troubleshoot problems	A-9 Write up maintenance requests	A-10 Perform preventative maintenance as assigned	A-11 Maintain shift logs	A-12 Perform housekeeping tasks
B-6 Monitor chemical strength & temperature	B-7 Replace resin	B-8 Inventory chemical stocks				
C-6 Maintain deaerator venting	C-7 Monitor dissolved oxygen	C-8 Monitor strainer differential pressure				
D-6 Maintain storage tank level, pressure & temperature	D-7 Check bleeder trip valves					
F-6 Check sample system	F-7 Check magnetic separator	F-8 Check grizzlies	F-9 Check dust suppression system	F-10 Monitor fuel quality	F-11 Control storage siloh level	
G-6 Check direct current oil pumps	G-7 Check lube oil temperature, level & pressure	G-8 Check lube oil strainers & filters	G-9 Check auto-start function of all lube oil pumps	G-10 Check lube oil cleaning devices	G-11 Verify vapor extractor is functioning	
H-6 Run hopper sprays	H-7 Rod bottom ash	H-8 Monitor economizer ash hoppers	H-9 Check economizer ash hoppers	H-10 Check crushers	H-11 Check blower discharge for dust	H-12 Check blowers
I-6 Check seal air	A-7 Check cleanout chain	I-8 Check startup fuel oil	I-9 Check pyrites	I-10 Check exhauster	I-11 Check coal feeders	I-12 Check coal mills
I-18 Rake the screens	I-19 Check pond levels					
J-6 Check induced draft fan lube oil	J-7 Check absorption sprays	J-8 Check tangential sprays	J-9 Check lime loop	J-10 Check water chemistry	J-11 Check tank levels	J-12 Check lime slakers

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J **Maintain Scrubber System – Cont.**	J-13 Check lime silos	J-14 Check seal water	J-15 Check ponds	J-16 Check agitator	
K **Maintain Baghouse System**	K-1 Check hopper temperatures	K-2 Check inlet temperature	K-3 Check pulse air pressure	K-4 Check baghouse cell differential pressure	K-5 Check hopper levels
L **Maintain Combustion Air System**	L-1 Check forced draft & primary air fans	L-2 Check forced draft & primary air fan lube oil systems	L-3 Check steam air heaters	L-4 Check auxsteam to glycole heaters	L-5 Check glycole pumps
M **Maintain Percipatator System**	M-1 Check banks	M-2 Rap banks			
N **Maintain Boiler System**	N-1 Check seal trough & temperature	N-2 Check air pre-heaters	N-3 Check re-tracks	N-4 Check soot blowers	N-5 Check air pre-heater soot blowers
O **Maintain Stator System**	O-1 Check pumps	O-2 Check filters	O-3 Adjust cooling water flow	O-4 Check stator system pumps	O-5 Alternate pumps
P **Maintain Generator System**	P-1 Check temperature differentials	P-2 Check hydrogen cooler temperatures	P-3 Check for vibrations		
Q **Maintain Service Water System**	Q-1 Check pumps	Q-2 Check coolers	Q-3 Check cooling tower	Q-4 Check cooling water temperature & level	Q-5 Check system chemistry
R **Maintain Uninterruptible Power**	R-1 Check battery room exhaust fan	R-2 Check battery water levels	R-3 Check inverter	R-4 Check battery chargers	
S **Maintain Seal Oil System**	S-1 Check tank level	S-2 Check differential pressure	S-3 Check oil temperature differential	S-4 Check filter differential pressure	
T **Maintain Circulating Water System**	T-1 Check inlet screens & tower level	T-2 Check fans	T-3 Check water system pumps	T-4 Check condenser inlet & outlet pressure & temperature	
U **Maintain Bearing Cooling Water System**	U-1 Check pump condition	U-2 Maintain bearing cooling water temperature	U-3 Alternate coolers as needed		

K-6 Check fluidizing air & vibrators	K-7 Check inlet & outlet poppets					
L-6 Check glycole system						
N-6 Check low frequency horns	N-7 Check sonic air horns					
O-6 Check flow & temperature	O-7 Check deionizer	O-8 Check heat exchanger	O-9 Check system pressure	O-10 Check tank level		
Q-6 Check cooling tower fans						

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Duties	Tasks				
V Maintain Raw Water System	V-1 Check valve pits	V-2 Check coolers	V-3 Check pumps, pond level & pressure		
W Maintain Compressed Air System	W-1 Check coalescing filters	W-2 Blowdown air receivers	W-3 Check dew point hydrometer	W-4 Check system instrument service pressure	W-5 Check plant compressors
	W-6 Check instrument air dryers				
X Maintain Auxiliary Power System	X-1 Check flags on breakers	X-2 Check transformers			
Y Maintain Bleach Generator System	Y-1 Check tank levels	Y-2 Check bleach generator system pumps	Y-3 Check operation		

Tools, Equipment, Supplies and Materials

Handtools
Fire extinguisher
Valve wrenches
Personal protective equipment
Air wrenches
Air monitors
Heat detectors
Sonic ear
Air lance
Heavy equipment

Worker Behaviors

Strong work ethic
Mechanical aptitude
Professionalism
Curious
Observative
Positive attitude
Willingness to work flexible hours

Future Trends and Concerns

- Greater than 300 megawatt plant size – Generalized
- Less than 300 megawatt plant – specialized duties
- More computerization

General Knowledge and Skills

Scope of practice
- Career progression – hierarchy – pathways
- Job shadowing
- Apprenticeship program
- Union/nonunion plants
- Organizational charts

Energy generation
- Types of generation: Hydro, windfarm, coal-fired, geothermal
- History of power regulations
- History of electricity

Safety
- Adhere to OSHA regulations
- Personal protection equipment
- HazCom training
- Adhere to Federal Energy Regulatory Commission (FERC) regulations

Mathematics
- Metro conversions
- Perform addition, subtraction, multiplication, decimal conversion, fractions without calculator

Chemistry
- Basic water chemistry
- Types of water treatment

Computer literacy
- Design spreadsheets
- Word processing
- Electronic communication
- Familiar with handheld PCs and PDAs

Electrical theory
- Motors
- Generators
- AC theory
- DC theory

Energy conversion
- Fuel (chemical energy)
- Thermal energy
- Mechanical energy
- Electrical energy

Pumps
- Types
- Positive displacement
- Electrical
- Alignment
- Theory
- Seals
- Air compressor

Bearings
- Types
- Theory
- Basic lubrication
- Seals

Hydraulic theory
- Valves
- Safety
- Types
- Theory
- Operation

Print reading
- P & IDs
- Electrical
- Logic
- Symbols
- Process
- Draw systems

System logic
- Digital control systems (DCS)
- PLC
- Reading (control

Plant cycle
- Steam system theory
- Turbine theory
- Condensate system theory
- Thermodynamics
- Feedwater system
- Basic fans

Combustion
- Fundamental theory
- Fuels

Instrumentation
- Gauges theory
- Construction
- Control logic
- Loops
- Conversions
- Transmit ID
- Types
- Temperature indications
- Valve controllers

Environmental issues
- Stack gases
- Water discharge
- Noise
- Environmental controls

Simulation
Internship