



*An Energy-Efficiency Workshop
and Exposition*

Orlando, Florida

*Energy Security Through Distributed Generation at the
Great Lakes Naval Service Training Center*

Peter Behrens

U.S. Navy



Great Lakes

- Navy's only "Boot Camp"
- Urban Campus Environment
 - Student Population of 35,000
 - 1700 Acres
 - 240+ Institutional buildings
- Facilities Team Midwest is the Utility Provider on the campus



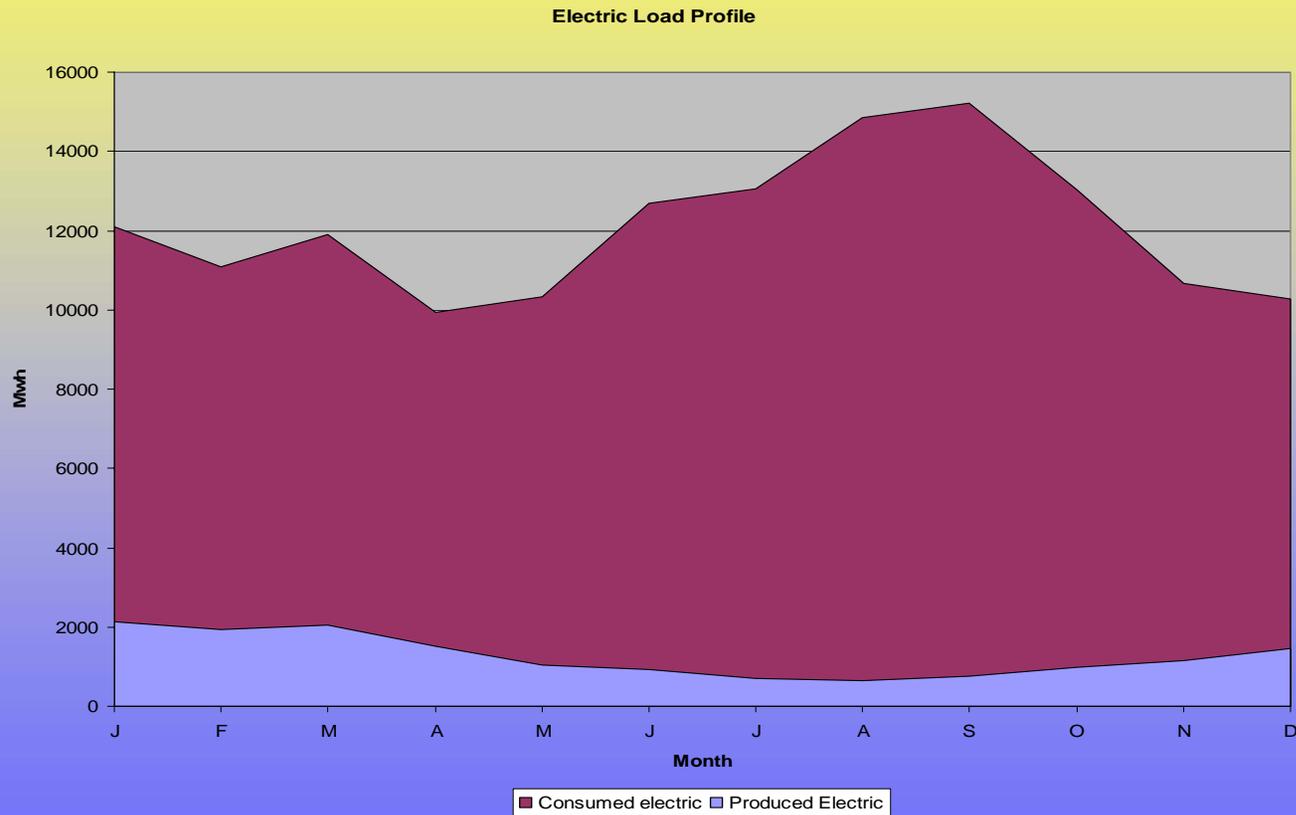


Existing Conditions - Electric

- 31 Mw peak demand, 150,000 Mhr/yr
- Purchase 91%
 - COMED Discounted Rate 6L
- Produce 9%
 - 2-1500 Kw Back pressure steam turbines
 - Thermal following mode



Existing Electric Load Profile



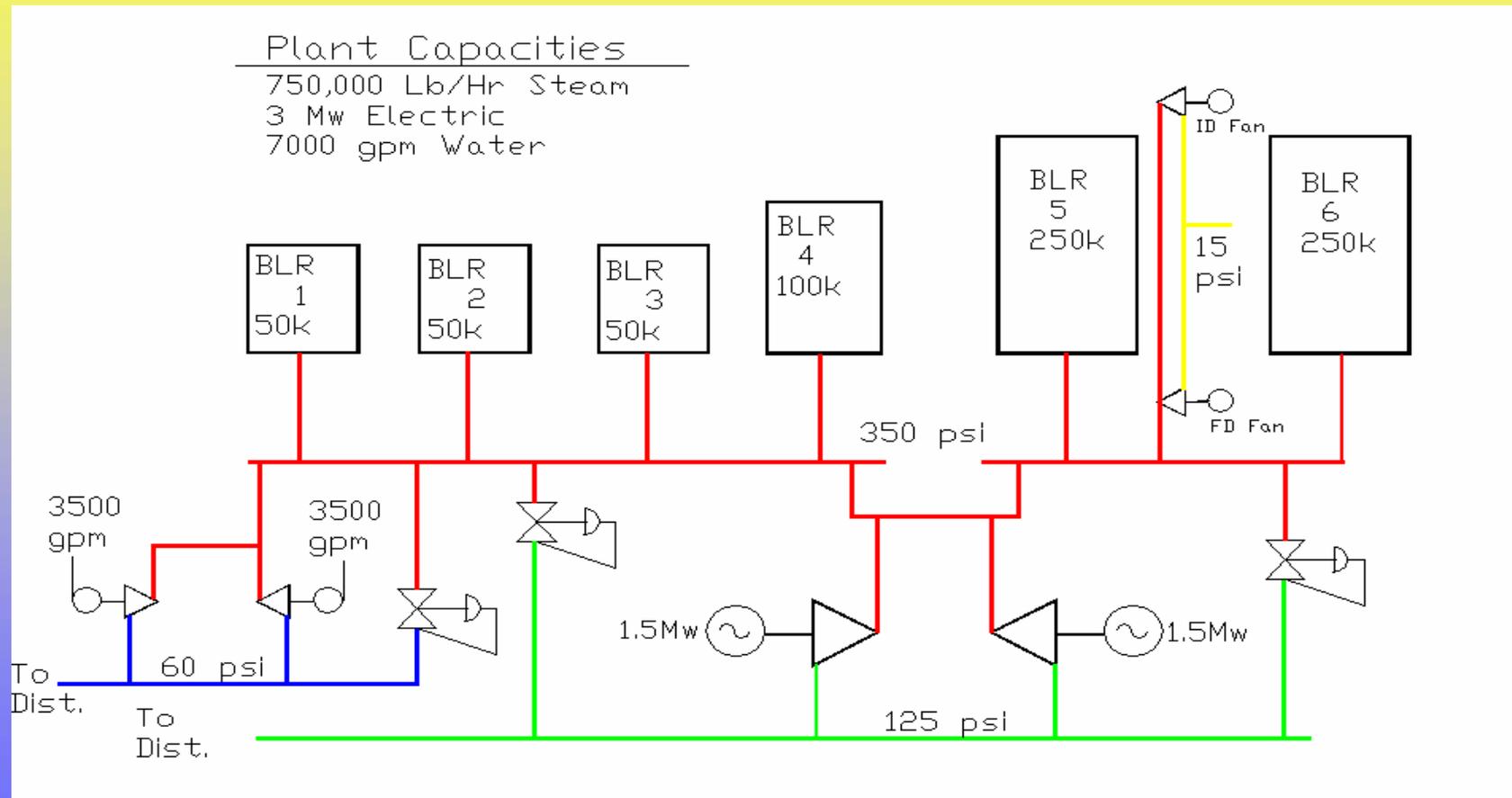


Existing Conditions - Steam

- Central Plant
 - 750,000 Lb/hr capacity
 - 370,000 lb/hr peak load
- Plant Equipment - Boilers
 - 3-50,000 lb/hr gas/oil 1941
 - 1-100,000 lb/hr gas/oil 1948
 - 2-250,000 lb/hr gas/oil 1965

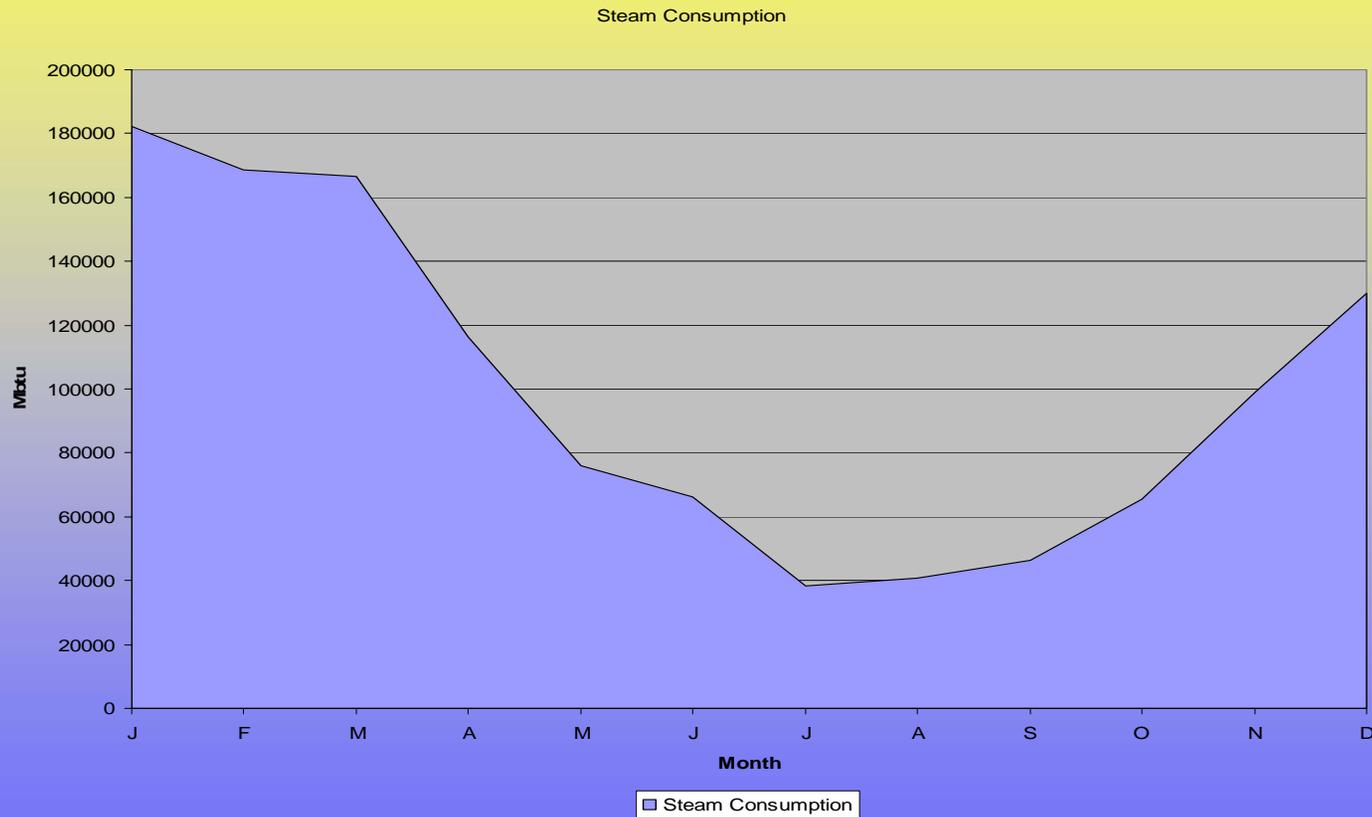


Existing Plant Layout





Existing Steam Load Profile





Energy Market/Projects

- Illinois deregulated it's electric market in 1999
- Great Lakes Discounted Electric Rate expires 2006
- 1995 UESC w/COMED (Exelon Federal Services) for work in the buildings
- 2002 Audit of plant and distribution systems
 - Recommended condensate line replacement
 - Fuel oil Conversion
 - 2-5Mw Gas Turbine/Heat Recovery Steam Generators

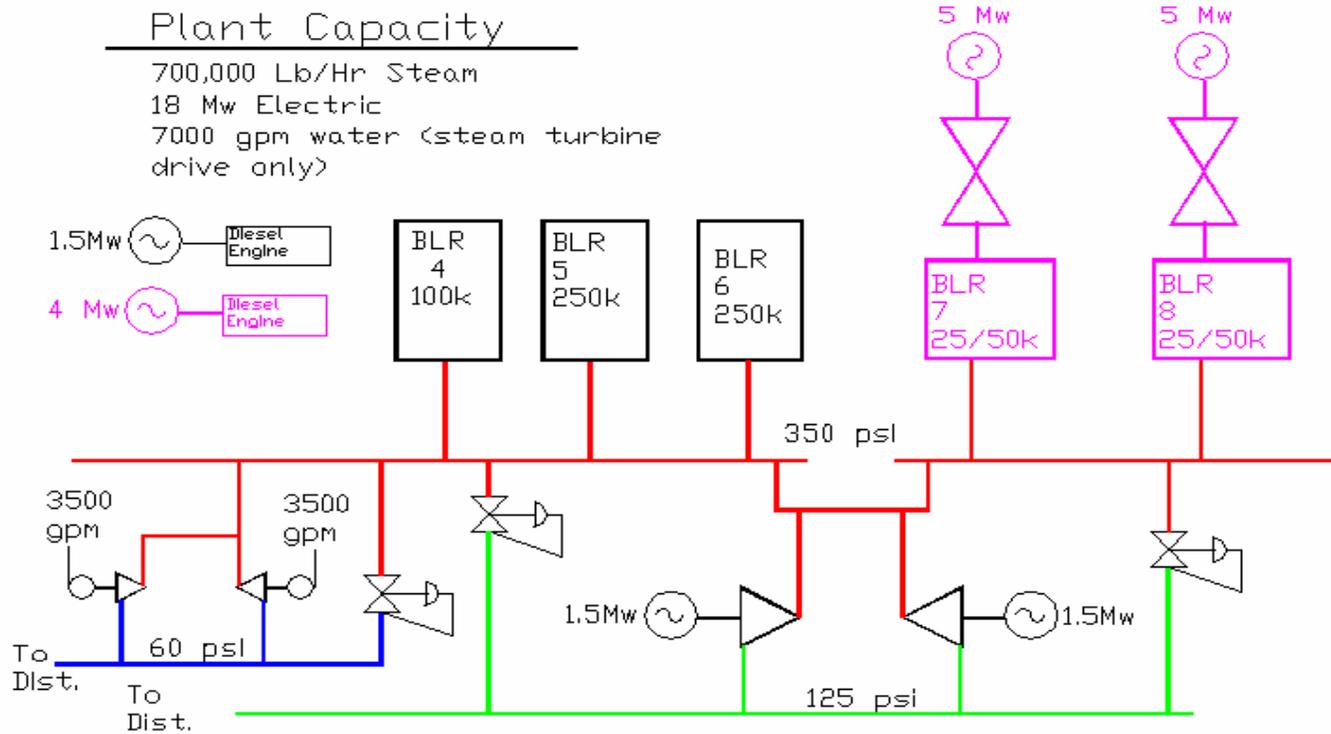


UESC Project

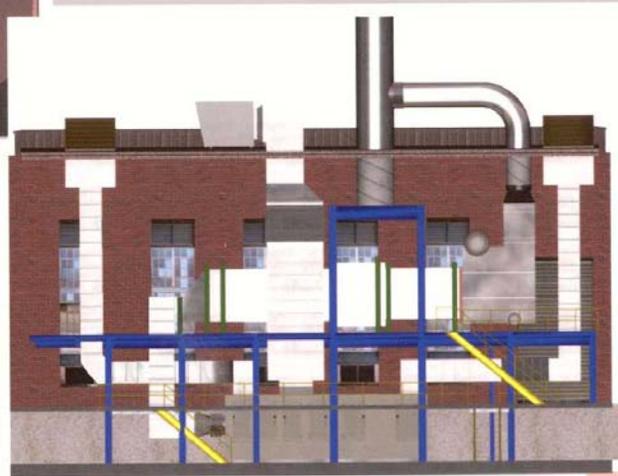
- Exelon proposal
 - Replace 6300 lf of condensate piping
 - Convert existing boiler draft fans to VFD's
 - Convert existing #6 oil system to #2 oil
 - Replace existing 50 Kpph boilers with 2-5 Mw GT/HRSG's



New Plant Layout



2003 Energy



GLNTC PHASE 9
CENTRAL PLANT UPGRADES



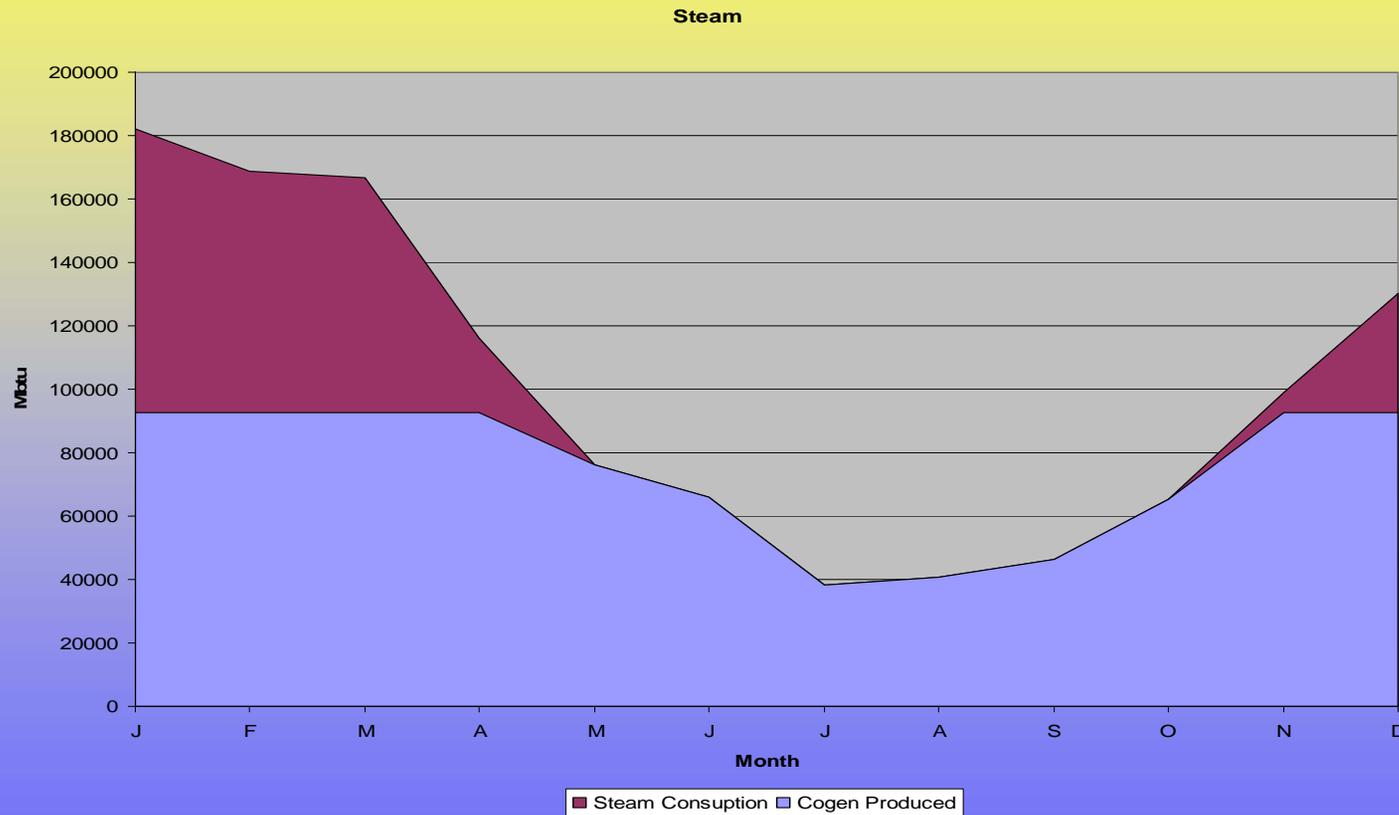
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www.energy2003.ee.doe.gov

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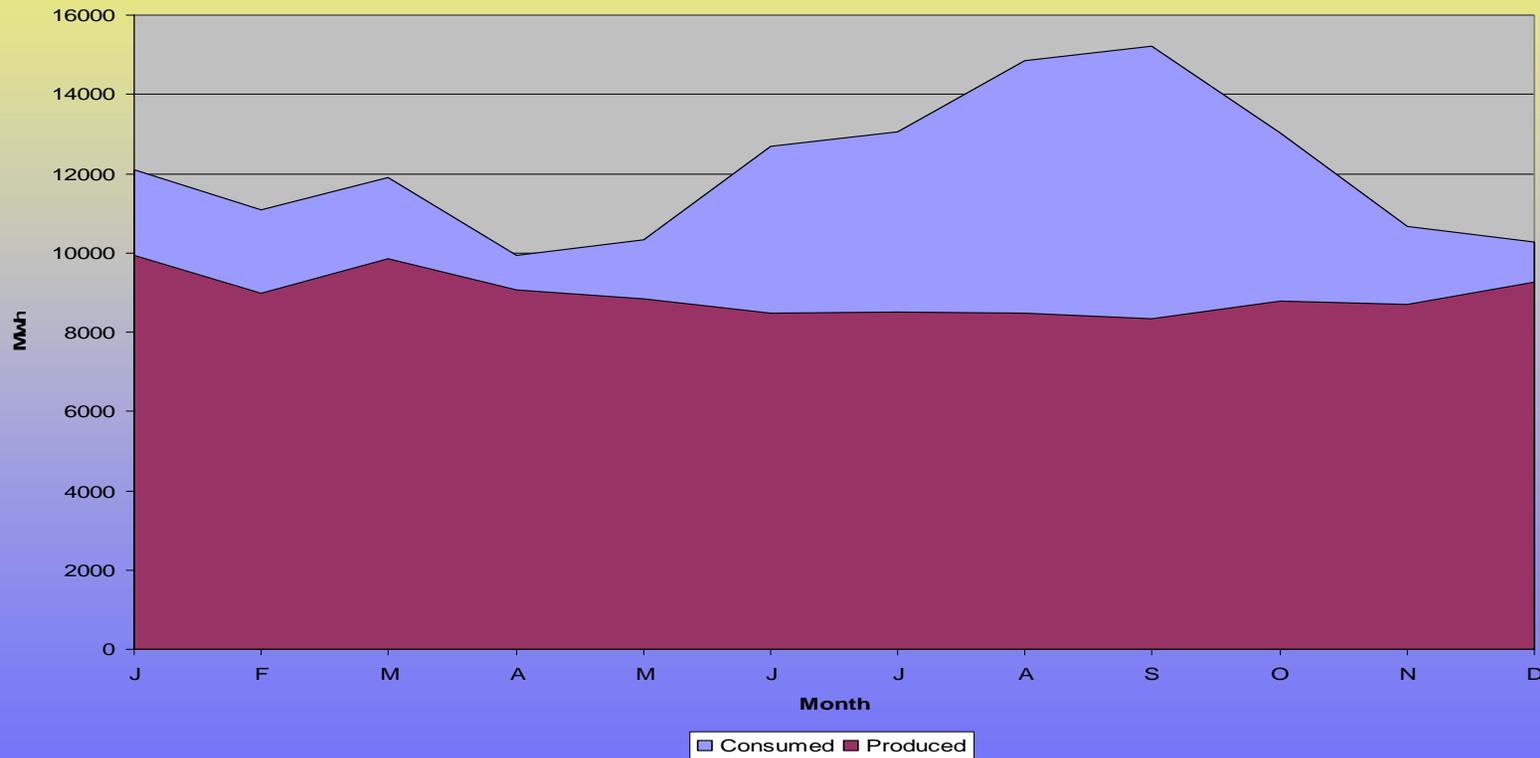
New Steam Load Profile





New Electric Profile

Electric Load Profile





Economics

- Project capital cost \$35M
- Financed through UESC
 - Simple payback 10 yrs
 - 15 year financing term
 - \$3.4M/yr payment
 - \$3.5M/yr savings



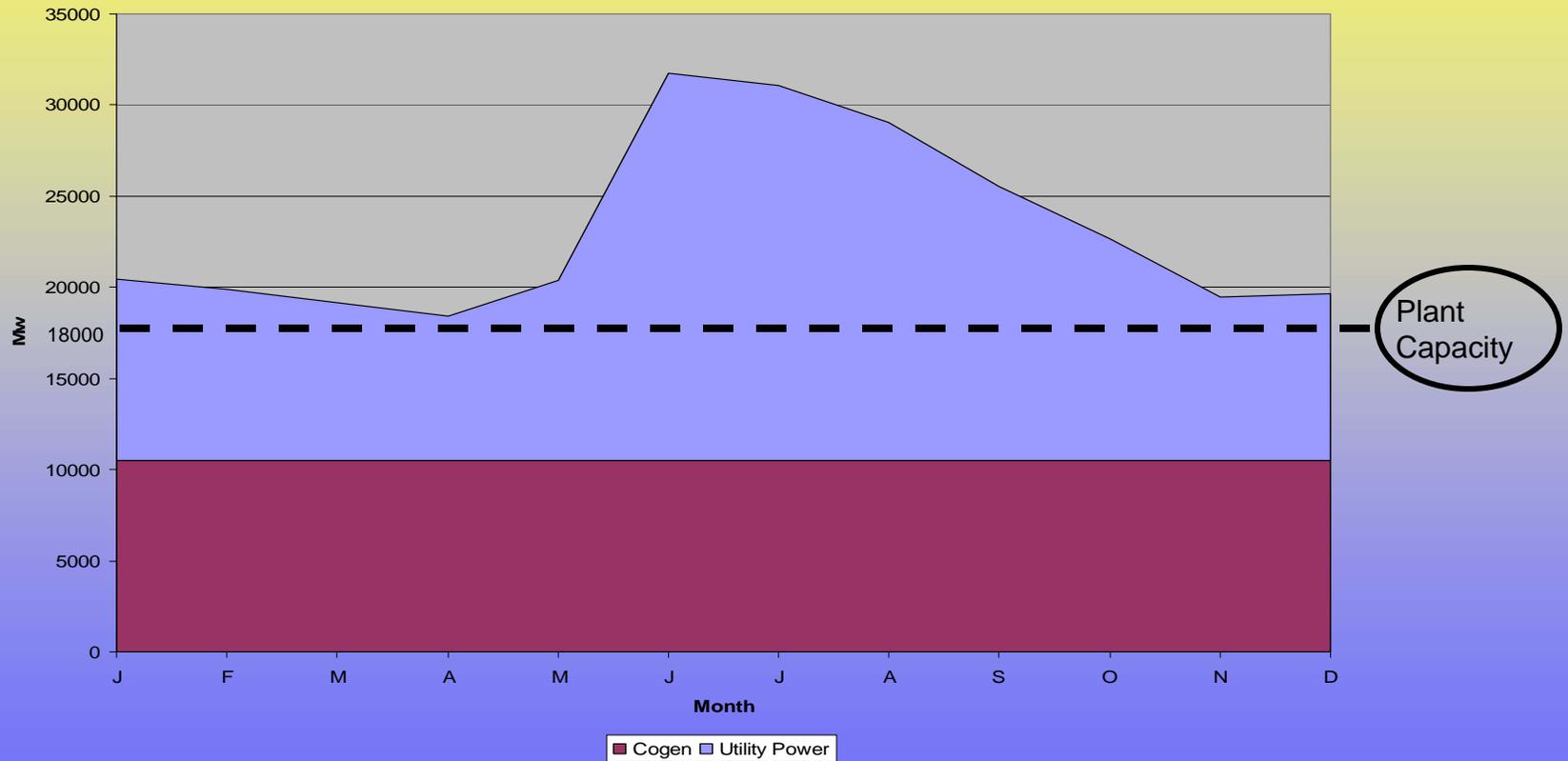
Energy Security

- Existing system dependent on Utility power
 - Power plant only capable of keeping the core utility plant in power
- New Plant
 - Capable of generating over 50% of the facilities requirement
 - Capable of keeping the Navy's core mission operating in Island mode with on-site fuel source



Demand Profile

Electric Demand





Questions?



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Please be courteous to our speakers



*Turn off all cell phones
and
Set pagers to vibrate*