Demand Factor Analysis

Electric Power Load Analysis (EPLA)

Revision of 8 June 2026

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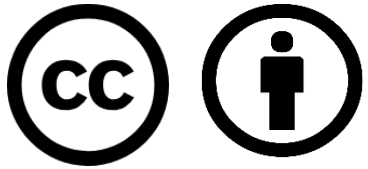
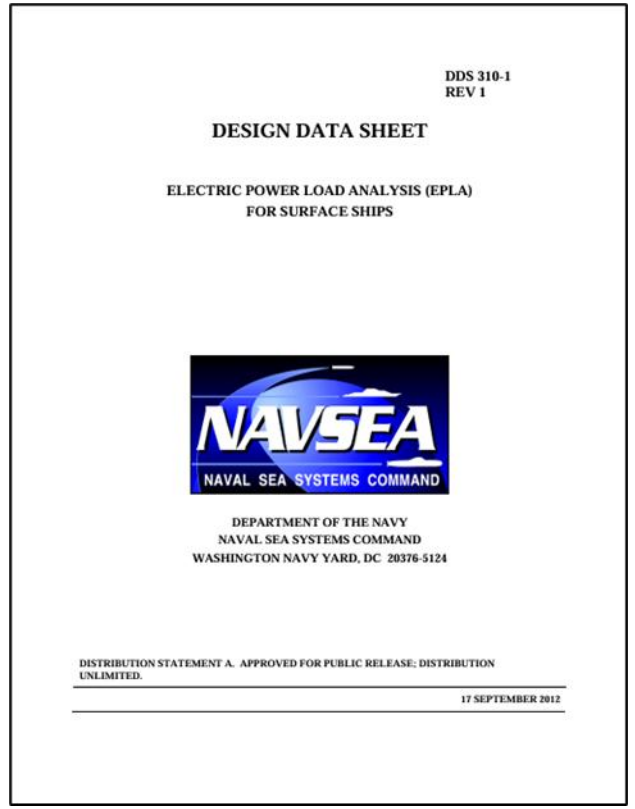


Essential Questions

When should Demand Factor analysis be performed?	Understand
What are the alternatives to Demand Factor analysis?	Understand
How is Demand Factor analysis performed?	Apply
What are the limitations of Demand Factor Analysis?	Understand

Introduction – Demand Factor Analysis

- Used to determine the load current for
  - Cables feeding load centers (and power panels)
  - Circuit breakers protecting the cables
  - Load center (power panel) bus rating
- Legacy Method
  - Zonal load factor method or stochastic method preferred
- Process defined in DPC 310-1



DDS 310-1
REV 1

DESIGN DATA SHEET

ELECTRIC POWER LOAD ANALYSIS (EPLA)
FOR SURFACE SHIPS

NAVSEA
NAVAL SEA SYSTEMS COMMAND

DEPARTMENT OF THE NAVY
NAVAL SEA SYSTEMS COMMAND
WASHINGTON NAVY YARD, DC 20376-5124

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Procedure

“The analysis consists of calculating the connected load for each bus feeder by summing the connected load of all the loads attached to the bus feeder.

Margin and service life allowances are applied to this sum to produce the bus feeder connected load.

The bus feeder and the circuit breaker protecting the bus feeder shall have the capability to service a total load calculated by multiplying the bus feeder connected load expressed in amps with the demand factor from (Figure 1) for 450 volt AC systems or by multiplying the bus feeder connected load expressed in kW with the demand factor from (Figure 2) for other voltages or DC systems.”

from DPC 310-1

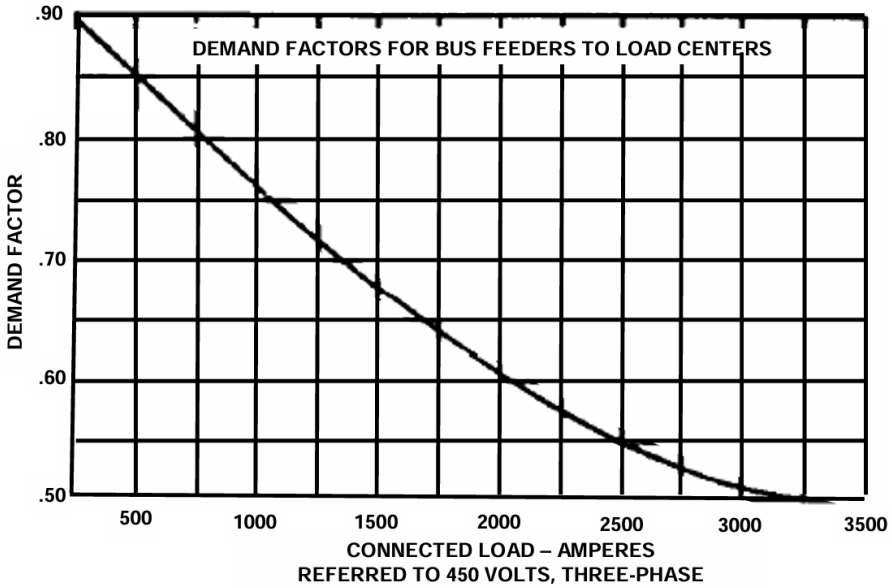

Figure 1: Demand Factor Curve (from MS 18299 via DPC 310-1)

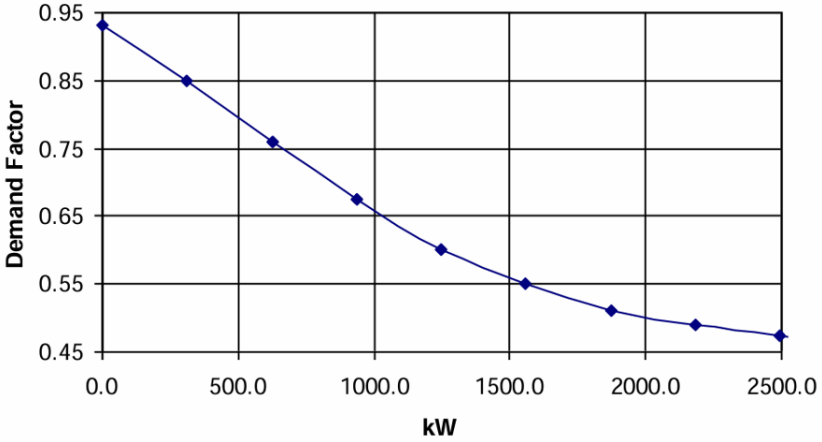

Figure 2: Demand Factor Curve based on connected load (from DPC 310-1)

Discussion

- Demand factor method is attractive for its simplicity
  - Only need information in the load list
- Down side is that it is purely empirical
  - May not provide a good estimate if the loads behave in aggregate differently than loads normally encountered in shipboard systems
- Other methods with better traceability to data are preferred