

ACTION ITEM NO: 2-147

DATE SUBMITTED: 19 JUL 98

SUBMITTED BY: MALS-31

PROBLEM:

Procurement of additional Power Distribution Boxes.

DISCUSSION:

The current Table of Basic Allowance (TBA) authorized allowance of five (5) Power Distribution Boxes to each MALS is inadequate to meet the power requirements of a fully employed Aviation Combat Element under the MALSP concept. Nor will the current allocation meet the additional power requirements of such facilities as the HCT-10 (HY-04/05) and the increasing use of double-wides like CASS.

RECOMMENDATION:

Provision, procure and distribute to the Fleet more Power Distribution Boxes to meet the CCSP and composite requirements of a MALSP concept contingency.

STATUS: 29 JUL 98

ACTION AGENCY:

NADEP NORTH ISLAND (Code 48701)

Open. NADEP North Island Code 48701 to provide analysis.

COMPLETION DATE:

16 NOV 98

STATUS: 12 NOV 98

Closed. Action Item 2-147 recommends that additional Power Distribution Boxes (PDB) units be supplied to each MALS to meet the CCSP and composite requirements of a MALSP concept contingency.

By direction of NAVAIR, Code 3.1B.4, NADEPNI Code 48701 was tasked to determine if the number of (5) five PDB's allotted for each MALS by the Table of Basic Allowances (TBA) was adequate for a notional mix deployment under the MALSP concept.

The PDB serves the function of distributing power from generators to Mobile Facilities (MF)'s. The PDB feeds power to integration unit MF (INUMF)'s which further distribute power to (MF)'s connected to the INUMF. The PDB can also be connected directly to stand alone MF's.

Before the PDB was used, generators were connected directly to the INUMF's to provide power distribution to the MF complex. The PDB's were introduced to provide the following benefits:

1. Supply uninterrupted power to a complex since two operating, synchronized generators can be connected to the PDB. When one generator needs servicing, it can be replaced while the other generator connected to the PDB provides a flow of power to the connected MF's. Therefore, generator power is always available to the MF's connected to the PDB.
2. The PDB better utilizes the power output of the generators by providing a common distribution bus. This allows connection of more MF's to the generators. A PDB provides twelve 200 amp and two 100 amp outputs.
3. As a result of the greater power loading of the generator, maintenance problems stemming from insufficient loading of a diesel generator are reduced. Also, the number of generators can be reduced since their power output is better utilized. Hazardous material protection measures related to the generators can also be reduced.

To determine if PDB requirements were greater than the TBA allotted, NADEPNI Code 48701 reviewed power requirements for an MF deployment. The MF complex group used for the example of a notional mix deployment was the CCSP for a fixed-wing. This example was taken from the manual "Complexing of Mobile Facilities per Table of Basic Allowances" which was compiled by Mobile Facilities Engineering. NADEPNI Code 48701 examined the power requirements for a deployment into an environment where the normal temperatures would be below 40 degrees F. The minimum electrical loads that would normally be required in this situation are the electrical lighting and the Environmental Control Units (ECU)'s. The ECU's would be operating with auxiliary heat coils on - its highest power draw. NADEPNI Code 48701 calculated the required power for this load and from this calculation allocated the five PDB's to the complexes that required the most power. There were nine complex groupings. Two of the PDB's could power two complexes each if the complexes were adjacent to one another. But three PDB's would power only one complex each. NADEPNI Code 48701 discovered that the allotment of five PDB's was not enough to distribute power to all complexes. This was due to the amount of power required by the MF's, the power that all of the PDB's could supply, and also the physical layout of the groups.

The number one benefit of the PDB is the feature of uninterrupted power. The PDB, connected to two operating generators, can provide power for an indefinite time without interruption. If uninterrupted power is not required for some MF's, the other benefits provided by the PDB can also be provided directly from the MEP-009 generator. An adapter box could be attached to the MEP-009 generator and provide six 200 amp and one 100 amp outputs - half the number available on the existing PDB. As a result, two generators modified with this attachment would provide the same power output connections as one existing PDB. Again, this would be an option if the feature of uninterrupted power were not be a requirement. MF's that could have power shut off for a short time during generator change-out could use this simpler, cost-effective solution instead of using power from an existing PDB.

In summary, five PDB's are not enough to distribute all available power to all complexes in the example of a CCSP for a fixed-wing deployment. However, PDB's combined with generators (that supply INUMF's and MF's directly) could provide power to all complexes in the example if the following conditions exist:

1. Power to the deployed aviation combat element is provided by generators.
2. 24-hour a day uninterrupted power is not a requirement for all MF's.