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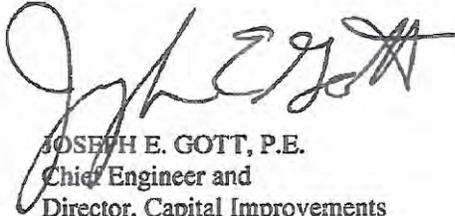
Type: Policy

Subject: Design Engineering Competency (In-house design)

Reference: (a) COMNAVFACENGCOM letter 3540 dated 29 OCT 2009

Attachment: (1) Policy for Design Engineering Competency

1. **Purpose:** Establish policy on the use of in-house design, along with other in-house engineering functions, to develop and maintain design engineering competency within the Capital Improvements Business Line (CIBL).
2. **Scope and Applicability:** Applies to all Capital Improvements (CI) resources at ECH III and IV (including PWDs) that perform design as a designer or Design Manager (DM).
3. **Implementation:** Adherence to the Policy for Design Engineering Competency, attachment (1) is required. The main tool employed in the implementation of the engineering competency policy is the Engineering Competency Sustainment Model (ECSM) which shall be used to plan and track IH design efforts.
 - a. **Acquisition Planning:** Operations (OPS), Acquisition Support Line, and CIBL coordinate to establish the Acquisition Plan. The ECH IV CI Business Line Coordinator (BLC), in coordination with the Business Line Team Leads (BLTL) and/or Project Management and Engineering (PM&E) Branch Heads, will ensure technical competency goals are met during acquisition planning.
 - b. **Tracking & Reporting requirements:** BLTLs and PM&E Branch Heads will report programmatic results to the CI BLC. The CI BLC will report to their respective Business Line Manager
4. **Support:** A new Discipline Support Structure (DSS) has been established to provide Community Management to specific engineering and architectural disciplines. The DSS matrix is located on the Capital Improvements Design page on the NAVFAC Portal - https://portal.navy.mil/portal/page/portal/ci/ci_cm/discipline_support_structure.xls
Per reference (a), this policy is effective immediately.



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23 November 2009 3540

From: Commander, Naval Facilities Engineering Command

Subj: DESIGN ENGINEERING COMPETENCY

Encl: (1) Engineering & Construction Bulletin 2010-03, Design Engineering Competency

1. Engineering competency is critical to NAVFAC's ability to provide the Joint Warfighter and all Supported Commanders with the engineering expertise necessary to accomplish their missions. Across NAVFAC, an unprecedented workload surge and a significant shift in our workforce demographics have forced a low level of in-house design, eroding our design engineering capability. Restoring and retaining in-house technical competencies are essential to providing services effectively and efficiently.

2. NAVFAC must be able to quickly execute mission requirements (projects), and to do this we must maintain our core competencies. To ensure that we maintain our engineering competency, NAVFAC is implementing a policy which will require our designers to perform in-house design on a continuous basis. This will keep our design engineering skills sharp and our professionals up to date with the latest technology. The amount of in-house design will be based on business rules established in support of our corporate strategy and Component Command demographics.

3. I strongly support the implementation of enclosure (1).



W. G. SHEAR, JR.

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Corresp/Design Eng Competency

Policy for Design Engineering Competency

1. Purpose. Establish Naval Facilities Engineering Command policy on the development and sustainment of Design Engineering Competency within the Capital Improvements Business Line (CIBL).

The accomplishment of in-house design, along with other in-house engineering functions (including DB RFPs, Consultations/Studies, and PCAS services), is necessary to develop and maintain the design engineering competency necessary to deliver Capital Improvements products and services to our Supported Commanders. This Policy Memorandum establishes the framework and guidance for determining the amount of in-house design and other in-house engineering functions that each engineer¹ should be accomplishing to develop and sustain competency in the traditional engineering disciplines.

2. Scope and Applicability. Applies to all Capital Improvements resources at Echelon III and IV (including PWDs) that perform Designer or Design Manager roles and responsibilities as identified in Appendix A.

3. Background. The establishment of corporate execution goals, the NAVFAC Transformation, and the recent workload surge have all contributed to the decline of NAVFAC's design engineering competency.

In October 2004, NAVFAC outlined corporate goals for the execution of Military Construction (MILCON) Design-Build (DB) and Design-Bid-Build (DBB) projects as well as the amount of in-house (IH) and contracted architectural/engineer (AE) effort. The goal of 5% for IH DBB and the type of projects selected has not been sufficient to develop or maintain the level of design engineering competency that previously existed within CI at NAVFAC.

With execution as priority for the Integrated Product Team (IPT), the amount of In-House (IH) design has diminished significantly due to prioritization of the Design Manager (DM) and Project Manager (PM) roles in lieu of designer roles. [Note: DM reflects the management of a design project which is separate from the actual designer responsibilities, i.e. analysis, calculations, etc.]

¹ The term Engineer or Engineering is used generically to include architecture, and traditional engineering disciplines; civil, structural, mechanical, electrical, and fire protection

The recent workload surge has forced NAVFAC to rely heavily on the DB project delivery method and a greater reliance on A&E contract services, causing the percentage of IH DBB to drop below the 5% goal.

4. Objectives. For Military Construction Navy and Navy Reserve (MCON/MCNR) projects the acquisition strategy goal of 75% DB and 25% DBB remains. The amount of IH and AE effort will be dependent on the demographics of a particular Component and the workload within that Component.

For other MILCON, Special Projects, Operations and Maintenance (O&M) projects, and reimbursable work (REIMB) the acquisition strategy goal (DB vs DBB) as well as the amount of IH and AE effort associated with that goal is flexible and dependent upon the demographics, workload, schedule constraints, and available design funds.

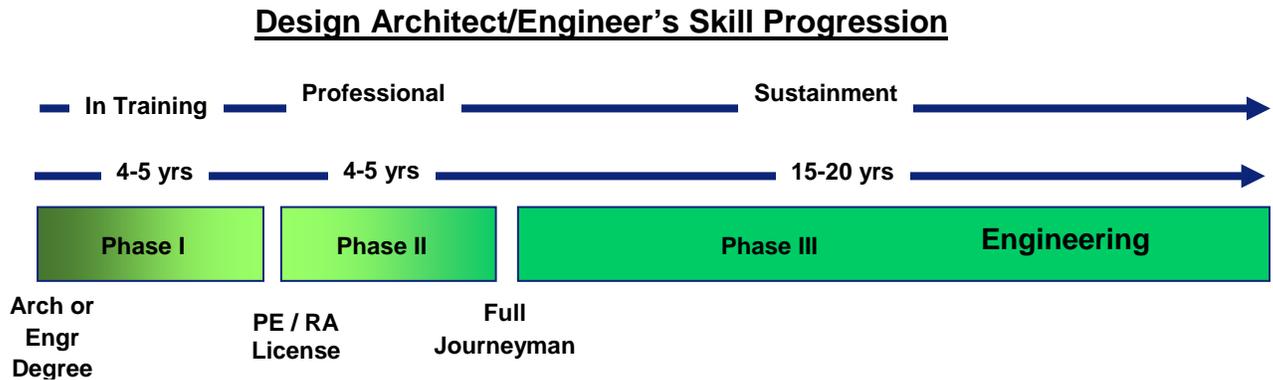
Exclusive use of a single strategy is unacceptable as it is not beneficial for the growth and sustainment of competencies and does not make full use of available acquisition tools in managing workload fluctuations.

5. Requirements. Each Component shall use the Business Rules below to determine the amount of in-house DBB and DB a Designer or Design Manager should accomplish. These Business Rules are based on demographics and minimum percentages of IH DBB and DB with respect to those demographics. OPS, CI and ACQ management are responsible for selecting appropriate acquisition strategies commensurate with these demographics and percentages to ensure that Designers and Design Managers are getting the appropriate mix of in-house DBB and DB work. The preferred approach is a mixture of execution and acquisition strategies to ensure each Component is utilizing all the tools at their disposal in order to manage potential/actual workload fluctuations. It is not desirable to utilize a single strategy or ignore one or more of the available tools. CI is responsible to ensure that IH DBB and DB are included in Designers and Design Managers' Individual Development Plans (IDPs).

6. Business Rules. The business rules below provide target demographics and minimum IH DBB and DB percentages. When combined, these business rules provide target goals during the acquisition strategy planning of individual offices to ensure the development and maintenance of the design engineering competency of the designers in each particular Component (Core/IPT/PWD).

a. Demographics: The specific demographics of a Component are based on the existing experience levels of current and projected employees. When assessing the current demographics and deciding on workload

distribution goals for the Component, succession planning must be considered. NAVFAC’s Policy for Professional Licensing of Engineers and Architects applies to all phases of skill progression.



i. Below are target demographics.

For Core and for Medium and Large IPT and PWD

	Demographics
Phase I	20%
Phase II	20%
Phase III	60%

For Small IPT and PWD

	Demographics
Phase I	0%
Phase II	20%
Phase III	80%

- ii. Small IPTs or PWDs typically cannot support Phase I designers because they may only be one deep per discipline, therefore the one-on-one mentoring of the Phase I designer is not available. The FEC Core, as well as the larger PWDs and IPTs, should be used as the training ground of Phase I designers.
- iii. Career design engineers who never attain their registration shall be included in Phase II with less than 10 years and Phase III with more than 10 years of experience.

- iv. New hires with 10 or more years of experience with the AE community, but no NAVFAC experience shall be included in Phase II or III dependent on their abilities.
- v. Engineering technicians who perform design-related support shall be included in Phase II.

b. IH DBB and IH DB Percentages: The percentages below represent the minimum desk level time a Designer or Design Manager should spend working on in-house DBB and DB projects in each phase of their career development.

	In-house DBB	In-house DB
Phase I	50%	5%
Phase II	30%	20%
Phase III	15%	35%

c. PCAS (G-Line) and AE DB/DBB (E-Line): PCAS and review of AE DB and AE DBB submittals are also important to the growth, maturity, and competence of the workforce.

d. Consultation (N-Line): Consultation is a very valuable to the growth, maturity, and competence of our engineers and architects. The percentage of consultation should increase in Phase II and increase again in Phase III. PWDs typically have the opportunity for a fair amount of consultation (N-Line). The total amount of consultation in an IPT or a PWD will be determined based on requests from Supported Commands, (e.g. shipyards traditionally have a large percentage of consultation).

7. Programmatic Management Tool - Engineering Competency Sustainment Model (ECSM). It is important that CI management have the ability to plan and track in-house design efforts to ensure that Designers and Design Managers are accomplishing an appropriate amount of in-house work to develop and sustain engineering competency. The ECSM [https://portal.navy.mil/portal/page/portal/ci/ci_cm/eng_comp_sust.xls] is a tool that CI management will use to plan and track in-house design efforts. Specifically, Capital Improvements Business Line Team Leaders (CI BLTLs) and PM&E Branch Heads (at PWDs with multi-disciplined E-Line assets capable of accomplishing in-house design) will use the ECSM to plan and report programmatic results to the Engineering and Design Product Line Coordinator (CI4 PLC). The Echelon IV CI4 PLC will review the individual office submissions and recommend adjustments where appropriate to meet the requirements of this design engineering competency policy. The Echelon IV CI4 PLC will prepare a consolidated report for the FEC and submit the results to the

Echelon III Design Product Line Manager (CI4 PLM) to ensure that corporate in-house design targets are being met. The two Design Product Line Managers will coordinate with the Design Product Line Leader to review and adjust if necessary the policy/tool to ensure that Design Engineering Competency is developed, grown and maintained throughout NAVFAC.

The process for completing the ECSM is outlined below:

Percentages from the model will vary year to year.

1. Review demographics to determine the percentages within each phase.
2. Load minimum IH DBB and IH DB percentages into the model.
3. Load PCAS, AE DB, and AE DBB percentages as appropriate for the demographic phase and the office workload.
4. Review projected Consultation manhours and distribute appropriately to each Phase within the model by percentage of total workload.
5. Run model to determine target percentages for each acquisition strategy. If initial workload distribution leads to unacceptable distributions among the acquisition strategies, make adjustments.
6. Review the project lists and select appropriate projects for execution by IH DBB and IH DB based on the guidelines and the suggested assignments (Attachment A). Select appropriate acquisition strategies (AE DBB or AE DB) for remaining projects.
7. Determine acquisition strategy percentages from projects selection and compare to requirements indicated by the model.
8. Assign in-house DBB and DB project to the appropriate designers based on the demographics and minimum percentages.
9. Coordinate percentages required by model and percentages developed by the project selections. Make adjustments as necessary and report any anomalies that are not in accordance with the intent of the ECSM.
10. Every six months, conduct a line item review of each designer's assigned projects to ensure that the appropriate amount of desk level in-house DBB and DB work is being accomplished.

8. Discipline Support Structure. To support the development, growth, and sustainment of NAVFAC's design engineering competency as well as align the various Component discipline communities, a discipline support structure is established.

- a. Technical Discipline Coordinators/Managers/Leaders: The structure will consist of a Technical Discipline Coordinator (TDC) in the CI Core at the ECH IV level whose responsibilities include the Community Management for the discipline Community of Practice (CoP) at their FEC. A Technical Discipline Manager

(TDM) will be established at each of the ECH III Commands. For most disciplines, one of these TDMs will be dual-hatted as the Technical Discipline Leader (TDL) for NAVFAC. The roles and responsibilities of the TDL/M/C have been defined in Appendix B.

Full time TDCs will be established in the Core at the larger FECs. At small FECs, TDC responsibilities will be dual-hatted roles for experienced engineers and architects. Small FECs may also reach back to the ECH III to cover some of these TDC responsibilities.

- b. Interns: To support an understanding of NAVFAC and to expose interns to the full breadth of CI's execution responsibilities, intern rotations will typically consist of separate CM, PM, design IPT, and design PWD rotations. Interns should be assigned to the CI Core during their internship (administrative control) typically under the leadership of the discipline TDC. Operational control can be delegated during a rotation, however the administrative control should always remain in the CI Core. After completion of the internship, interns (Phase I engineers) should be assigned to an IPT or PWD only if there is an appropriate "mentor" available on the IPT or PWD as the "Responsible Charge." Assignment during an internship to a specific IPT/PWD to fill existing vacancies makes intern rotations very difficult.

9. Implementation. This policy is effective immediately. Due to current demographics and workload at the FECs, full implementation is expected to be incremental. Every effort to obtain full implementation as soon as possible is expected, but shall not take longer than two years. After implementation, if a FEC experiences an unexpected shift in workload or demographics and the design targets are no longer achievable, report the situation through the design product line for support and possible mitigation.

Appendix A

https://portal.navy.mil/portal/page/portal/ci/ci_cm/rr_designer_design_manager.doc

Appendix B

https://portal.navy.mil/portal/page/portal/ci/ci_cm/tdl_rr.doc

IH DBB Project Selection Guidelines

IPT and/or Core

- Available workload:
 - The Core and BLTLs should collaborate and conduct a programmatic review of MCON/MCNR, other MILCON, and CNIC Special and Specific project lists to select potential IH DBB projects. This review should be conducted prior to establishing Headquarters' Lock Dates for MILCON projects.
 - Schedules for selected projects should be evaluated and developed based on the IH DBB strategy.
 - Evaluate Congressional Adds and other project requests/authorizations as they are received for potential IH DBB.

- Projects selected for IH DBB should be:
 - Initially choose non-complex multi-disciplined projects to build and progress competency skills. Consider assigning a Phase I designer to design a smaller part of a larger project. Example projects would include administrative facilities, warehouses, and building additions typically with a value of less than \$10M. Less complex projects will build and test competency skills without high risk to the project. This will also help in determining whether a designer is in Phase I, II or III. A Phase I designer should always have a licensed Phase II or III designer assigned to the same project to ensure proper technical oversight and mentoring/training occurs.
 - Single/double-disciplined projects although multi-discipline projects are preferred. Where single/double-discipline projects are assigned to Phase I designers, senior designers should evaluate the projects thoroughly to ensure that teams are staffed appropriately with all required disciplines.
 - As skills continue to progress, choose more challenging, but not overly complex projects. There is a need to stretch the abilities of designers in all phases, but particularly young designers who need to see new and different aspects of their discipline.
 - For experienced design teams with Phase II and III designers, typically choose projects mid-range in price, (\$3M-\$20M). Select challenging projects to strengthen competencies and retain experienced designers.
 - Project cost is only one gauge in selecting appropriate projects. Complexity and time constraints are all factors that might drive an in-house solution and present a great opportunity to develop, grow, and sustain our IH design engineering competency.
 - Don't take on projects that are so large that they tie up an unreasonable amount of IH resources or so small that the IH DBB strategy becomes overly expensive relative to project cost and is not challenging to the designer.

IH DBB Project Selection Guidelines

- Allow for a schedule that can meet Activity Initial Operational Capability (IOC) date, e.g. completion schedule is not critical to mission readiness. Don't take on projects where schedule slippage cannot be tolerated. Ensure project IOC dates match with the schedule requirements for the full DBB process.
- Choose projects not well suited for DB. Projects that lend themselves to DB should typically stay with that strategy. BQ's for instance are well suited to DB, templates already exist and we get good ROI for size of project. With standard facility DB templates in place, these types of projects should remain DB in most instances, but not always. If experience is required associated with one of the standard facility DB templates, consider IH DBB carefully in relation to ROI.
- Assignment of Projects:
 - Typically, each designer should be working on at least one multi-discipline IH DBB project in accordance with the desk time percentages calculated in the ESCM Model. Designers may also accomplish single or double discipline IH DBB projects in their area of expertise, but multi-disciplined projects are highly preferred.
 - Always ensure that the appropriate licensed IH expertise and technical oversight is available to the team. Taking on specialized or highly complex work without such expertise may result in costly change orders. Designers and their supervisor/mentor must know their own limitations and ask for support when faced with technical issues that are beyond their current capabilities.
 - Ensure that in addition to traditional disciplines a cost engineer is assigned to the IH project team. Ensure assignment of specialized disciplines such as Landscape Architecture and Interior Designers as appropriate. Ensure a QC review staff is assigned to review the work of the IH design team at each deliverable.

PWD

- Available workload:
 - Review CNIC/PWO Special and Specific Projects IPL and other reimbursable projects for good IH DBB candidates.
 - Schedules for selected projects should be evaluated and developed based on the IH DBB strategy.
- Projects selected for IH DBB should be:
 - Projects may be single/double-disciplined or multi-disciplined if the PWD has the necessary licensed designers on staff to accomplish the project.
 - Choose challenging, but not overly complex projects. There is a need to stretch the abilities of designers in all phases, but particularly young designers who need to see new and different aspects of their discipline.

IH DBB Project Selection Guidelines

- Do not choose projects that are so large that they tie up unreasonable amount of IH resources. Also don't take on projects so small that the IH DBB strategy becomes overly expensive relative to project cost.
- Choose projects not well suited to DB. Projects that lend themselves to DB should typically stay with that strategy. Some renovation work in particular is well suited to "scope of work – build to budget" strategy.
- Choose projects that are flexible with schedule, e.g. completion schedule is not critical to mission readiness. Don't take on projects where schedule slippage cannot be tolerated. Ensure project IOC dates match with the schedule requirements for the full DBB process.
- For emergent projects, use when schedule is critical.
- Assignment of Projects:
 - For PWDs with full licensed design staffs, each designer should participate on at least one multi-discipline IH DBB project in accordance with the desk time percentages calculated from the ESCM. Designers may also accomplish single or double discipline IH DBB projects in their area of expertise.
 - For PWD without full design staffs, choose single/double discipline IH DBB projects in their area of expertise, and consider reach-back to the FEC as appropriate for other required disciplines.
 - Always ensure that the appropriate licensed IH expertise and technical oversight is available to team. Taking on specialized or highly complex work without such expertise may result in costly change orders. Designers and their supervisor/mentor must know their own limitations and ask for support when faced with technical issues that are beyond their current capabilities.
 - Note for QC, if a licensed engineer is only one discipline deep and they are doing work that requires extensive analysis and calculations, technical review/oversight should be requested from the IPT or Core.
 - Ensure that in addition to traditional disciplines a cost engineer is assigned to the IH project team. Ensure assignment of specialized disciplines such as Landscape Architecture and Interior Designers as appropriate. Ensure a QC review staff is assigned to review the work of the IH design team at each deliverable.