



DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND
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IN REPLY REFER TO

NAVSEAINST 7300.14B
Ser 017/39
16 May 1996

NAVSEA INSTRUCTION 7300.14B

From: Commander, Naval Sea Systems Command

Subj: CLASSIFICATION OF COST ESTIMATES FOR SHIPS

Ref: (a) NAVSEAINST 7000.9 of 8 Jun 89

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Encl: (1) Classification of Shipbuilding and Conversion Cost
Estimates for Ships (SCN)

1. Purpose. To update guidance governing the use of a ship cost classification system developed to identify the credibility of Shipbuilding and Conversion, Navy (SCN) cost estimates for ships in terms of the information from which it was derived.

2. Cancellation. NAVSEAINST 7300.14A of 15 Jun 88

3. Background

a. The intent of this cost classification system is to convey the basis and associated inferred quality of estimates as submitted to support the Defense planning, programming, and budgeting process for new construction and conversion of ships under the cognizance of the Naval Sea Systems Command. This guidance is supportive and supplementary to the general guidance provided by reference (a).

b. Ship cost estimates are developed as inputs to the Program Objective Memorandum (POM), Extended Planning Annex (EPA), and budget submissions. Cost estimates are based on ship configuration and system requirements; economic, market, and related estimating assumptions; and the ship acquisition plan. The basis for developing a cost estimate varies from the time a ship concept is first considered to the time it is submitted in the Navy budget. This results in cost estimates that are increasingly more reliable as firmer information and more data become available.

c. Ship configuration information can vary from that of a mere generic ship-type designation with only generalized technical characteristics and listing of electronic and combat capabilities, to that of a ship type definition complete with a contract design, system specifications, and a detailed listing of government furnished equipment. Economic information can differ from the simple availability of Bureau of Labor Statistics material and labor indices to specific shipyard labor, overhead, and profit rates. Information related to market conditions can vary from a complete lack of known shipbuilder interest or degree of competitiveness in a ship procurement to complete information



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of the number and identity of interested bidders and their expected workloads. Ship acquisition plan information ranges from only program year identification, to specific contract type, award dates, start of construction, and delivery dates.

4. Policy

a. All cost estimates for ship construction, conversion, modernization, and ship life extension programs (SLEP) will be classified by the Cost Estimating and Analysis Division (SEA-017) in conjunction with the associated design and program management offices. Cost estimates prepared for early states of design should be classified by the appropriate personnel in SEA 017. The detailed guidelines for categorizing information and classifying cost estimate for ship programs with varying scope, detail, and information availability are defined in enclosure (1). The summary categories for classifying cost estimates are given as follows:

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<u>CATEGORY</u>	<u>CLASSIFICATION</u>
Budget Quality Estimate (New Construction)	C
Budget Quality Estimate (Conversion)	D
Feasibility "Ball Park" Estimate	F
Rough Order of Magnitude (ROM)	R
Directed or Modified Estimate	X

b. Ship acquisition planning and design will be performed by the appropriate Ship Acquisition Program Manager (SHAPM) with assistance from the cognizant Program Executive Officer (PEO); the Deputy Commander for Engineering (SEA 03); and the associated Weapons and Combat Systems Participating Manager (PARM) office(s) on every ship contained in a POM or budget submission. This shall be done so that ultimately budget quality cost estimates (Class C for new construction and Class D for conversions), as defined in enclosure (1), can be developed by SEA 017 of the Deputy Commander/Comptroller Directorate (SEA 01). Adequate internal documentation shall be prepared supporting the basis for the classification of any cost estimate submitted to higher authority.

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c. If it appears that a budget quality cost estimate may not be available at the time of the NAVCOMPT budget submission for any ship program that has a ship in the first year of the budget submission, a Plan of Action and Milestone (POA&M) to achieve a budget quality estimate will jointly be developed by the SHAPM and SEA 017. Whenever it is necessary to submit a cost estimate with a class F or R classification, the design and estimating process must continue persistently until a Class C for new construction and Class D for conversion is achieved. This requirement exists even though funds have already been appropriated by Congress for the ship involved.

d. Final determination of the classification of a ship cost estimate must rely heavily on the professional judgment of the responsible SHAPM and SEA 017. For the specific ship class

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procurement, the SEA 017 responsible estimator will provide an assessment of the degree to which the available technical information, cost estimating data, and programmatic factors meet the cost estimate classification requirements. On the basis of that assessment, the cost estimate classification shall be assigned and documented. (R)

5. Action. All cost estimates will be classified by the SHAPM and SEA 017 in accordance with the guidelines contained in enclosure (1). SEA 01 will confirm the classification of each planning, programming, or budgetary cost estimate before transmittal to all concerned elements of the Navy requiring such information. When forwarding a cost estimate, it is imperative that the proper identification of the estimate classification be predicated on the appropriate design, economic, and production information and that adequate documentation be maintained in the Command. SEA 017 shall be the normal repository for such information. (R)



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CLASSIFICATION OF SHIPBUILDING AND CONVERSION
COST ESTIMATES FOR SHIPS (SCN)

1. The degree of design and cost information available for the development of ship and cost estimates varies considerably from the time a ship need is initially identified to the time a shipbuilding contract is awarded. To indicate the degree of reliability of cost estimates, a system of classifications for new construction, conversion, modernization, and SLEP cost estimates for ships is provided. Classifications C to R are indicators of the availability and degree of detail of technical design, program planning, and economic information. Classification X is a descriptor to reflect policy actions taken either prior to, or subsequent to, the development of an estimate identified as one of the Classes C through R.

2. The intended use and brief description for each classification of a cost estimate are as follows:

a. Class C - Budget Quality Estimate (New Construction)

(1) This is the highest quality cost estimate attainable in the planning, programming, and budgetary process for a new construction ship. A Class C estimate is the recommended classification of cost to be used for budget submittals to the Congress, NAVCOMPT, and OSD/OMB for the current budget year.

(2) The general attributes of a Class C budget quality cost estimate are as follows:

(a) It is developed by the professional cost estimators in SEA 017.

(b) It provides high confidence that the program can be executed within the budget.

(c) It contains reasonable contingencies commensurate with identified uncertainties and risks, and

(d) It avoids unrealistic management/technical assumptions that may foster subsequent cost overruns of "get well" claims.

(3) An approved OPNAV Operational Requirements Document (ORD) is essential. Likewise, an approved ORD for the on-board weapon systems is a requirement. The approved Preliminary Design Report (PDR) including a Master Equipment List with the Preliminary Design Weight Estimate developed to the three digit Ship Work Breakdown Structure (SWBS) level must be available for each ship prior to establishing a Class C budget quality estimate. Costs for a complete government furnished material (GFM) equipment list and any required government furnished information (GFI) are to be incorporated in the ship cost estimate. A list of potential shipbuilders should be developed to determine appropriate labor rate, overhead rate, and cost of

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Enclosure (1)

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money factor, as applicable. An industry capacity analysis should be made and realistic award dates and building periods should be established. The degree of concurrent development required for contractor furnished equipment (CFE) and GFM should be evaluated to the extent possible. In addition, cost impacts resulting from special category items or government support costs should be assessed. These would include programmatic costs such as, test and evaluation, test and instrumentation, NAVSEA in-house support, on-board spares, shore based stock spares, Supervisor of Shipbuilding requirements, computer compatibility costs, tech manuals, and trainers.

(4) Equipment allowances and their costs obtained outside of NAVSEA must be documented by official memoranda. The lead times for advanced material procurement; expected award, start of construction, and delivery dates for applicable ships; inflation rates; and the adequacy of the industrial base of GFM suppliers should be known. The electronics, weapons, propulsion, etc., equipment should be sufficiently defined and developed technologically to eliminate any developmental costs. If items of uncertainty do exist, appropriate growth factors must be included and the cost estimate documentation additionally noted. The cost estimating relationships (CERs) used to calculate the cost estimate should be based on: (1) an accepted weight estimate when using bid information, and (2) current weight estimate when using contractor's current Cost Performance Report (CPR) cost for ships of similar type and construction.

(5) "Risk" considerations have significant influence in the determination of Class C cost estimates. If major equipment (GFE or CFE) have not met the requirements of "Approved for Full Production," an additional cost allowance for an alternative fall back position may be justified for a Class C cost estimate.

(6) Projected shipyard escalation cost calculations should be based on SHAPM developed ship contract award, start of construction, and delivery construction schedules plus OSD/OMB (R) approved labor and material index projections. These calculations should be made using the approved SEA 017 escalation model.

(7) If technical design, program planning, or economic (cost) information is lacking credibility or, in the opinion of the SEA 017 cost estimator, significant information is questionable or not up-to-date, the cost estimate shall be classified either F, R, or X.

b. Class D-Budget Quality Estimate (Conversion/Modernization/SLEP)

(1) There are uncertainties related to ship conversions, modernizations, and Ship Life Extension Programs (SLEP) that cannot be resolved until after the contract award; therefore, a Class C classification is never appropriate for these types of estimates. The uncertainties are as follows:

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(a) Scope of repair package (determined after open and inspect).

(b) Quality of repair cost estimates.

(c) Requirements for shipyard industrial and workforce build up and capability for sustaining manning.

(d) Shipyard work force limitations to perform needed labor hours of work during scheduled availability.

(e) The number of ship crews available for production and support work during the conversion, modernization, or SLEP, i.e. how much of the actual work package will they accomplish?

(2) For a conversion, modernization, or SLEP cost estimate to conform to this classification, the detailed scope of work requirements shall include the description and weights of equipments or systems to be removed, relocated, or added, as well as a list of proposed ship alterations (SHIPALTS), GFM, and an adequately defined repair package. Costs for similar SHIPALTS, ship repairs, and modernization items from comparable conversions or SLEPs should be available, or a "first cut" shipyard cost estimate of projected repairs, SHIPALTS, and modernization improvements plus the potential interface problems of these items should be determined as related to the existing design. An allowance should be made to recognize that the ship condition may differ considerably two years after the budget is submitted, i.e. when the ship is actually worked on. Also required are: (1) the status of the current shipyard workload and additional workload projections for the prospective conversion, modernization, or SLEP shipyard, (2) productivity considerations, (3) realistic projection of labor rates at the shipyard, and (4) the expected use of premium pay for overtime, if the schedule so requires.

c. Class F - Feasibility design "Ball Park" Estimate

Class F estimates are those costs prepared by using design information resulting from ship feasibility studies. The feasibility study produces at least rough one digit SWBS ship weights and only general guidance with respect to major electronics and weapons equipment. Cost estimates that fit this classification also involve those derived by inflating to current dollars a previous cost for a similar ship and making gross adjustments for expected changes in design, program requirements, or program cost factors. Any cost estimate that is derived from a current POM/Budget year estimate by deflating or inflating to some other year by the application of a labor and material shipbuilding index will be designated Class F. The shipyard type (private or naval) and number of ships to be built in a single yard are often not known when deriving "Ball Park" cost estimates. Escalation calculations are either based on inflating the escalation cost contained in the total cost estimate used as the base estimate or by using a flat percentage of the shipyard portion cost estimate based on an approximation calculation. Cost estimates are also often designated a Class F even though

(1) shipyard assignment is known, (2) complete acquisition strategies are available, and (3) an escalation run is made on the SEA 017 model. The major elements generally missing that necessitate using the designation of Class F rather than Class C are the lack of a completed preliminary design and current economic information.

d. Class R - Rough Order of Magnitude Estimate (ROM)

ROM is a Rough Order of Magnitude estimate based on design information that does not meet the standards equivalent to a ship feasibility study. The design study may produce rough order ship weights, but the bases for the weights and other ship design parameters are not founded on sufficient technical information and analysis to support high reliability in the design. Some examples are: (1) a new design of an unconventional ship platform, (2) a ship platform that is initially designed to carry many unconventional or developmental equipment, and (3) a ship designed beyond the current state of the art. Other conditions that call for use of an R classification are as follows:

(1) Inflating a historical total ship cost 10 years or more, because such a time span is sufficiently long to generate a potential for changes in specifications or an outdating of electronics and combat systems.

(2) Projecting outyear ship costs beyond the current POM where long range economic and ultimate ship configuration uncertainties are attendant with such projections.

(3) Using nation-wide or area-wide labor and overhead rates instead of yard specific rates.

(4) Designing to roughly defined mission requirements.

e. Class X - Directed or Modified Estimate

(1) A cost estimate that is: (1) not developed by NAVSEA 017 through the normal estimating process, (2) provided by other commands or agencies, or (3) directed by higher authority will be classified X. Directed cost estimates are generally a total cost limitation that is established without the benefit of a fully developed design concept and related cost estimate. (R)

(2) A directed estimate is generally any previous cost estimate (Classes C through R) that was changed to conform to budget cuts or restrictions on a total cost that is not based on Class X are those sometimes referred to as "Congressional Control Number," "OPNAV control Number," or "OPNAV Planning Wedge."