OFFICE OF THE PARLIAMENTARY BUDGET OFFICER
BUREAU DU DIRECTEUR PARLEMENTAIRE DU BUDGET

Labour Sensitivity Analysis for the Acquisition of Two Joint Support Ships

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The mandate of the Parliamentary Budget Officer (PBO) is to provide independent analysis to the Senate and House of Commons on the state of the nation's finances, the government's estimates and trends in the Canadian economy and, upon request from a committee or parliamentarian, to estimate the financial cost of any proposal for matters over which Parliament has jurisdiction.

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1 Executive summary

In February 2013, the PBO released his cost estimate of the Royal Canadian Navy's Joint Support Ship (JSS).

PBO Report entitled "Feasibility of Budget for Acquisition of Two Joint Support Ships"

The PBO's model returned a point estimate of $3.28 billion. However, the report emphasized that because of the uncertainty surrounding building the JSS in Canada, a minimum budget of $4.13 billion ought to be set aside to reduce the likelihood of program failure. [1]

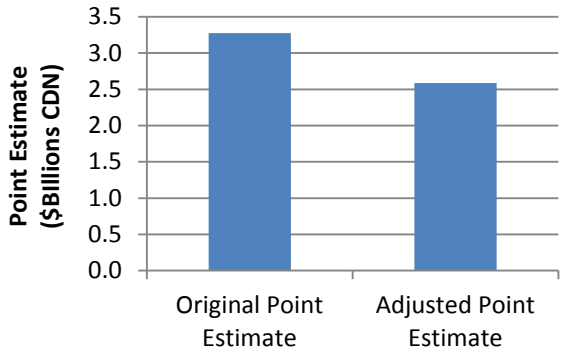
The JSS will be built in Vancouver's Seaspan Shipyards. As such, the PBO's model was based on a team with "mixed experience" and "some product familiarity." It was also based on Canadian labour and materials costs.

The PBO was asked by a parliamentarian to estimate the change in cost of producing the ship in "optimal conditions."[2] In other words, the parliamentarian asked how much the JSS would cost if it were built by a team with "extensive experience" and "familiar with the product."

For comparative purposes, the PBO modified its cost estimate to reflect the cost of producing the JSS in the United States (US) where there is a mature shipbuilding industry with experienced workers and wage and materials costs tend to be lower.[3]

When these changes are made, the model's point estimate drops from $3.28 billion to $2.59 billion, representing about a 21% decrease in cost.

Figure 1 PBO Point Estimates



Source: PBO Analysis

2 Relevant model inputs

Two inputs which go into the model reflect that the ships will be built in Canada: (1) experience of personnel; and (2) labour and materials rates.

2.1 Experience of personnel

Experience of personnel affects the hours and material needed to complete a project. The more experienced employees are: (1) the fewer hours needed to complete a task; and (2) the fewer errors made, affecting material waste and rework time.

The model provides a number of options available for this input.[4] At the time of the JSS report in February 2013, specific labour data for Seaspan was unavailable. The PBO relied, therefore, on expert analysis in adopting the assumption that Seaspan's personnel have "Mixed Experience, Some Product

[1] This is based on the minimum confidence interval of 50% suggested by the US Government Accountability Office's recommended practice. A budget estimate at the 50% confidence level suggests that, after accounting for project risks, there is a 50% chance of exceeding the budget and a 50% chance of coming in at or under budget.

[2] Section 79.2(d) of the *Parliament of Canada Act* requires the PBO to "estimate the financial cost of any proposal that relates to a matter over which Parliament has jurisdiction" upon request of a parliamentarian.

[3] The default US labour rates for the model are from the US Bureau of Labor and Statistics. These were adjusted according to the OECD's Purchasing Power Parities for GDP (PPPs) in the case of Canada. The accuracy of the adjusted labour rates was validated against available data on actual Canadian wages.

[4] See E Barkel and T Yalkin, "Feasibility of Budget for Acquisition of Two Joint Support Ships" Office of the Parliamentary Budget Officer, Feb 27, 2013 <http://www.pbodpb.gc.ca/files/files/JSS_EN.pdf> at 17, table 2-9.

Familiarity."[5] In responding to this request, the PBO adjusted this to "Extensive Experience, Familiar Product."

2.2 Cost of labour and materials

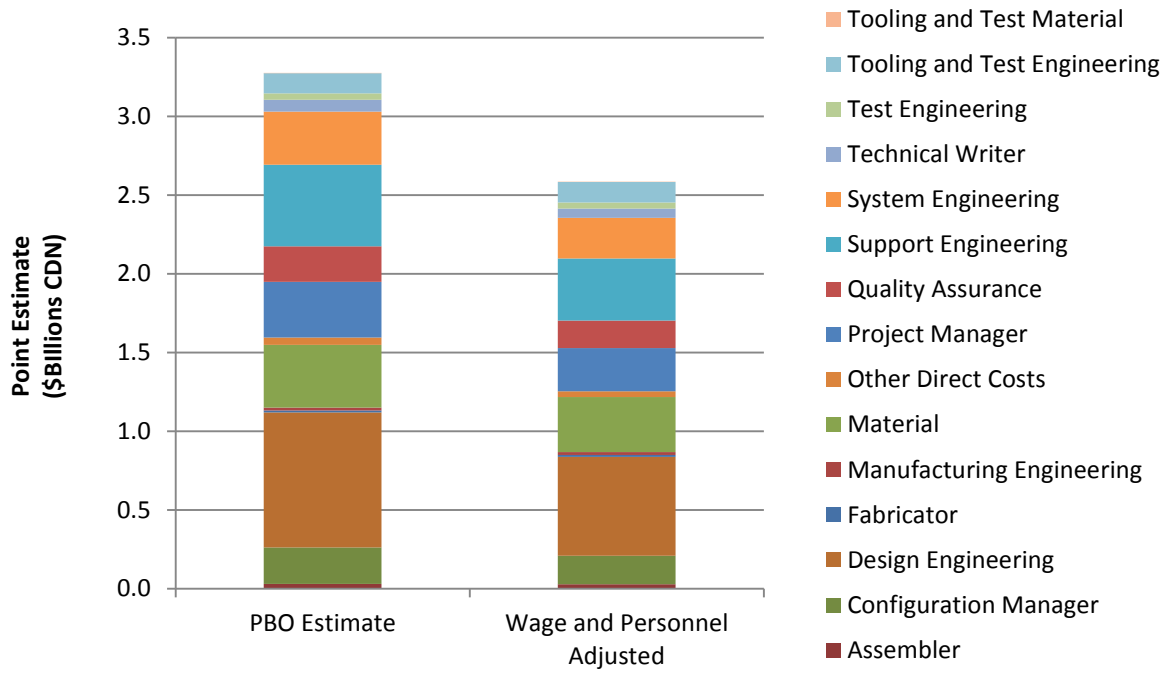
The original PBO estimate reflected the cost of labour and materials in Canada, as provided by the model. For comparative purposes, in responding to this request, the PBO adopted the cost of labour and materials in the United States (US).

3. Results

The combined effect of assuming a team with extensive experience, familiar with producing the platform and a US cost of labour and materials reduces the point estimate by about 21%. According to the model, instead of $3.28 billion, the point estimate is $2.59 billion (see Figure 1 above).

The original and adjusted point estimates reflect that the majority of the cost difference is the result of a reduction in the total cost of labour, attributable in roughly equal proportions to a reduction in the number of labour hours and reduction in the hourly cost of labour.

Figure 2 Point Estimate Comparison



Source: PBO Analysis

[5] This input was determined using analysis of the Seaspan and research from the RAND Corporation: G Petrolekas and D Perry, *Capacity Analysis of the Vancouver Shipyards (SEASPAN)* (26 February 2013) online: Parliamentary Budget Office <http://www.pbo-dpb.gc.ca/files/files/JSS_EN.pdf> at 41; H Pung et al, *Sustaining Key Skills in UK Naval Industry* (Santa Monica, CA: RAND Corporation, 2008) at 35.