

**From:** [Marsh, Michael](#)  
**To:** [Hines, Eric](#)  
**Subject:** RE: New Bedford Report Edits  
**Date:** Thursday, September 12, 2013 11:08:01 AM

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Eric - My reading of JASCO Report v. 5.0 Tables 6 and 7 indicate that the ConWep generated distance to the **peak pressure** criterion was 73 feet. The distance to the impulse criterion was 268 feet. The impulse distance was adjusted to 291 feet, but I'm not sure how.

Again, I think this demonstrates the need for a clear and detailed step-by-step description of the process JASCO went through in the analysis.

My take on the approach was that the ConWep model was used to estimate the distances to the peak pressure and impulse criteria. Impulse criteria was reached at a greater distance, and is thus more conservative. ConWep generated a distance to the impulse criterion for a 150 lb buried charge to be 268 feet.

Then I assumed that the 18.4 psi-msec impulse criterion and the 268 feet distance to that criterion was input into the Underwater Calculator spreadsheet, which in turn generated an equivalent free-water explosive weight meeting the impulse criteria and distance to that criteria. I had assumed that Underwater Calculator generated a free-water weight around 3.375 pounds, such that  $3.375 \text{ lb}/150 \text{ lb} = 0.0225$ , the "efficiency coefficient" for the 150 pound charge.

However, adjustments are somehow being made. The ConWep impulse criterion distance is 268 feet but the adjusted impulse criterion distance is 291 feet. We need a clearer explanation of the overall process, including clarification of exactly how adjustments are being made to which parameters, and why.

Furthermore, I'm not exactly clear on how the impulse values are then translated to the peak pressure analysis. I suspect it is via the adjusted efficiency coefficient, but I'm not sure exactly how the process works.

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**From:** Hines, Eric <ehines@lemessurier.com>  
**Sent:** Wednesday, September 11, 2013 9:02 PM  
**To:** Marsh, Michael  
**Cc:** Hines, Eric  
**Subject:** FW: New Bedford Report Edits

Mike,

I hope you don't mind, but I am going to send you the text of my comments without sending you a marked up word copy of the report.

The only place I added text was in section 2.2.3.3. At the end of this section, I suggested they write:

For example, for a 150 lb charge, the ConWep model produced a distance to impulse injury (i.e. an impulse level of 18.4 psi-msec) of 73 ft. In order to maintain a comfortable level of conservatism, Jasco approximately tripled the distance to 231 ft, which was consistent with the previously accepted distance to impulse injury for a 50 lb charge mitigated by a bubble curtain.<sup>[e1]</sup> Based on this 231 ft distance, Jasco then used the underwater spreadsheet to back-calculate an adjusted efficiency coefficient of 2.25%. In the underwater spreadsheet, as shown in figure <sup>[e2]</sup> an efficiency coefficient of 2.25% multiplied by the charge weight of 150 lbs, gives an effective charge weight of 3.375 lbs, which results in a distance of 231 ft from the source before the impulse levels attenuate to 18.4 psi-msec.

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<sup>[e1]</sup>I don't know how you chose this exact scaling scheme, but please provide an explanation similar in character to the one that I have hypothesized here. EPA won't accept the words about the model being "adjusted" without a detailed explanation as how how it was adjusted.  
<sup>[e2]</sup>Insert a figure here that is a screen shot of the underwater spreadsheet for this calculation.

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**Below is my email summarizing the main points of my edits. Feel free to call me tomorrow to discuss this further. If we need to, we can conference in Jasco tomorrow. Both David Hannay and Marie-Noel Matthews will be working on the report.**

**Eric**

**From:** Hines, Eric  
**Sent:** Wednesday, September 11, 2013 8:46 PM  
**To:** Marie-Noel Matthews; David Hannay  
**Cc:** Hines, Eric; Jay Borkland (jborkland@apexcos.com)  
**Subject:** New Bedford Report Edits

Dear Marie-Noel and David,

I have attached my comments and suggested edits to the report with track changes. These comments and changes are described in the following main points:

1. Getting from ConWep numbers to underwater calculator numbers has to be clearly spelled out, as a recipe. Attendent to this is the rationale behind the choice of calibration, which appears to be similar to the old 50 lb impulse distance with the bubble curtain and approximately 3 times the ConWep distance, but not exactly in either case. Please provide an explanation of the choice of calibration numbers.
2. An calculated example converting ConWep to underwater calculator should be provided, and a screenshot of this calculation in the underwater calculator should accompany this explanation.

3. There a figure with wave forms for a 30 lb charge. Please revise this for a 150 lb charge.
4. Please add figures 20 and 21, which are figures 18 and 19 on a scale of 1" = 2000 ft, so that one can get an appreciation for how small the distances to injury are with respect to the size of the entire harbor.

Please do not hesitate to call (617) 939-6686. If you are able to turn this around tomorrow, I will be grateful.

Thank you,  
Eric