From:	Marsh, Michael
To:	Dierker, Carl; Williams, Ann; Colarusso, Phil; Catri, Cindy; Lederer, Dave; LeClair, Jacqueline
Subject:	RE: Letter RE Underwater Acoustic Modeling of Explosive Rock Removal Operations
Date:	Tuesday, July 16, 2013 9:57:07 PM
Attachments:	image001.jpg image002.png image003.png

All - I spoke at length with Chet Myers and Eric Hines late today. We are trying to rectify some mathematical anomalies (which we all agree exist) between various shock wave/sound propagation models, to clarify the application of the JASCO acoustic modeling and supporting studies. The 7/12/13 JASCO letter addresses the issue I raised about the delay times versus the time over which impulse effects are measured. Also, it is notable that, according to Eric and Chet, Cashman indicated that the 25 msec delay time is somewhat of an industry standard, and that explosives often come pre-packaged with this delay "built in" (this was new information to all of us). So what started out as a theoretical concern appears to have been considered and addressed within industry practice.

Chet and Eric indicated that they were continuing to sort out the math and its application, and we seem to be on the same page. We agreed that they would put together a technical memo, resolving the mathematical discrepancies between the various models being applied, and clarifying the use of the models to support our determination of no adverse impact. I indicated that we would expedite our review of the technical memo when we received it, as we are all aware of the time critical nature of the review and approval process at this point.

Another issue that was raised (or at least mentioned) at one of the meetings was the impulse and pressure thresholds themselves. It is my understanding that the impulse and pressure threshold values used in the JASCO study were based on NMFS recommendations from studies of impacts to shortnose sturgeon (as a surrogate for Atlantic sturgeon). The JASCO modeling used these recommended values, based on the assumption that these thresholds would be protective of the species of concern present in New Bedford Inner Harbor during the time of year blasting is to occur. I'll defer to Phil on the issue of fish impact thresholds.

Mike

[redacted]

From: Bill White [mailto:bwhite@MassCEC.com]
Sent: Tuesday, July 16, 2013 4:55 PM
To: Dierker, Carl

Cc: Alicia Barton
Subject: FW: Letter RE Underwater Acoustic Modeling of Explosive Rock Removal Operations

Carl,

Please see the attached letter from Jasco Applied Sciences and Chet Myers' note below. As you know, this is the final, critical issue and the stakes for the project schedule are enormous. Please let us know if you can provide approval as soon as possible.

Many thanks,

Bill

Bill White
Director, Offshore Wind Sector Development
Massachusetts Clean Energy Center
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(617) 315-9330

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From: Chet Myers [mailto:cmyers@apexcos.com]
Sent: Tuesday, July 16, 2013 3:00 PM
To: Bill White
Cc: Eric Hines
Subject: FW: Letter RE Underwater Acoustic Modeling of Explosive Rock Removal Operations

Hi Bill,

As you know, MassCEC has protested Condition #7 of EPA's June 13, 2013 letter, which limits the total weight of explosive charges per shot used within blasting operations at the New Bedford Marine Commerce Terminal to 50 pounds, as such a restriction is infeasible.

Explosive use is typically applied with limits "per delay" rather than "per shot" as the "peak pressure" and "peak impulse", which are the two factors that are indicative of fish mortality and injury, can be minimized by keeping successive pressure (or successive impulse) waves from overlapping via the use of "delays" (tiny breaks between blast actuation times). As the blast waves travel very quickly, the "delays" are also very short, typically measured in milliseconds.

For the purposes of the model produced by JASCO Applied Sciences, the controlling "peak pressure" and "peak impulse" used as a basis of comparison were 75.6 psi and 18.4 psi-msec, respectively, which were derived from experimental results generated (and forwarded to Apex prior to the start of modeling in 2012) by NMFS. NMFS indicated that if the "peak pressure" and

"peak impulse" of the charges could be kept below these factors, then there should be no injury and/or mortality outside of the area of impact. Please note that the NMFS experimental data was gathered via testing on shortnose sturgeon and was intended to be predictive of whether mortality and/or injury would occur to Atlantic Sturgeon.

EPA has been requesting written confirmation that the model produced by JASCO Applied Sciences, Inc. is applicable to a "charge per delay" use of explosives.

We have been working over the past few weeks to re-engage JASCO, with whom we have previously had some contractual issues. Although we are still having contractual issues with JASCO, they were kind enough to issue this clarification letter last Friday.

The letter stipulates that the modeling conducted by JASCO is applicable to "charge weights per delay" in addition to single charges. Essentially, this means that the "peak pressure" and "peak impulse" levels will not change if there is one or multiple blasts, so long as the minimum delay is utilized.

Although JASCO acknowledges that the "peak pressure" and "peak impulse" waves last no more than a few milliseconds, JASCO recommends a minimum delay of 25 milliseconds, which is consistent with the 25 millisecond delay also used by NMFS within their study.

Thanks,

Chet Myers
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From: Marie-Noel Matthews [mailto:Marie-Noel.Matthews@jasco.com]
Sent: Friday, July 12, 2013 3:14 PM
To: Chet Myers
Cc: Jay Borkland; Roberto Racca; David Hannay; Scott Carr
Subject: Letter RE Underwater Acoustic Modeling of Explosive Rock Removal Operations

Chet,
Following our phone conversion on modeled results for explosive rock removal operations, I have attached the letter you requested.

If, after you read this letter, you have any concerns or questions, please don't hesitate to contact me.

Regard,

Marie-Noël R. Matthews
Project Scientist

_____

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