MEMORANDUM
From: Monterey Area Industrial Hygienist
To: Occupational Safety, Health, and Environmental Director, Naval Postgraduate School

Subj: NOISE MEASUREMENT SURVEY RESULTS

Encl: (1) Industrial Hygiene Noise Survey Report

1. I measured noise levels of the Halligan Hall, Room 101C’s wave machine’s operation on 7 February 2018.

2. Results and recommendations are discussed in enclosure (1).

3. I can be contacted for further clarification or consultation with respect to technical content of this report by telephone (Commercial (831) 656-1074) or e-mail (sethurst@nps.edu).

S. E. THURSTON

Copy to:
NPS Fac Mgr
INDUSTRIAL HYGIENE SURVEY DATA

Command: Naval Postgraduate School

Dept: MAE and Systems Engineering Departments

POC: Professor Joseph Klamo

Date: 7 February 2018

Location: Bldg 234, Room 101C

DESCRIPTION/BACKGROUND:

The noise survey was requested by the Naval Postgraduate School’s Facilities Manager due to concern by the adjacent Defense Resources Management Institute (DRMI) that members would be exposed to excessive noise levels by the wave machine’s operation. The request was for a noise survey to address the above in the Lab’s space as the first step in the Manager’s addressing the concern. The noise survey results can also be used as part of the comprehensive periodic industrial hygiene survey of the Systems Engineering Department’s processes.

Noise levels during the wave machine’s operation were measured to assess whether or not its operation posed a potential noise-induced hearing loss hazard. The wave machine, which is used to support student thesis projects, is set up to create waves in the water inside a very long tank present in the space, with waves created by a “paddle” (immersed in the water and attached to the rest of the machine) displacing the tank water when the machine travels up and down vertical rails located at one far end of the tank. A laptop computer connected to the wave machine is used to program its operation so that waves of different frequencies and amplitudes are created inside the tank, with sensors inside the tank measuring wave characteristics as they move away from the end of the tank having machine’s and its “paddle”.

RESULTS:

Noise levels were measured at both the table where the student use the laptop computer to program the machine and at ground level at the southwest corner of the tank, with results summarized in the following table:

<table>
<thead>
<tr>
<th>FREQUENCY, Hertz</th>
<th>AMPLITUDE, inches</th>
<th>MEASURED NOISE LEVEL, dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>0.25</td>
<td>63.9 – 65.8</td>
</tr>
<tr>
<td>0.85</td>
<td>1</td>
<td>70.4 – 72.7</td>
</tr>
<tr>
<td>1.5</td>
<td>0.25</td>
<td>65.7 – 67.2</td>
</tr>
<tr>
<td>1.5</td>
<td>1</td>
<td>70.2 – 73.1</td>
</tr>
</tbody>
</table>

Measurements at each of the two above, distinct locations are not separated in the table since levels measured do not approach the level where noise-induced hearing loss can occur with prolonged exposure.
DISCUSSION:
All measured noise levels were very much below the Navy noise health-hazard criterion level of 85 dBA, and the machine is not a noise-induced hearing loss health hazard source. As a result:
• wearing of hearing protection during the machine’s operation is unnecessary
• those present during the wave machine’s operation do not require enrollment in the command’s Hearing Conservation Program (that involves annual audiograms (hearing tests) and completion of hearing conservation training) due to noise exposure from this process.

RECOMMENDATIONS: None since a significant hearing loss health hazard does not exist.

The Industrial Hygienist can accommodate a request by the Facilities Manager to collect further noise measurements in the space(s) occupied by concerned DRMI members during the wave machine’s operation if the room number(s) is identified, but again, per the Navy’s BUMED Industrial Hygiene Program’s mission, those measurements will be limited to assessing whether or not a noise-induced hearing loss health hazard exists.

To better support the NPS Facilities Manager’s assessment, the Industrial Hygienist surmises that the concern likely arises from the DRMI member(s) having a space(s) located directly above the wave machine. Due to the removal of the sprayed-on fireproofing insulation on the room ceiling’s metal structure located in above the wave machine, any sounds detected in that spaces overhead low will likely be perceived as being louder since the insulation likely also dampened any sounds created in Room 101C. Rather than being a noise-induced hearing loss health hazard, the wave machine may serve as a distraction or annoyance by occupants of the second-floor space(s) above the wave machine’s location.

REFERENCES: BUMEDNOTE 6260 BUMED-44 of 9 May 16, encl (1), paras 1, 5 and 6 OPNAVINST 5100.23G, Ch 18, para 1808