



DEPARTMENT OF THE NAVY
NAVAL ORDNANCE SAFETY AND SECURITY ACTIVITY
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8020
Ser N841/1039
9 Jul 15


From: Commanding Officer, Naval Ordnance Safety and Security Activity
To: President, Naval Postgraduate School, Monterey
(MAE/K. Jones)
Subj: REISSUE OF CAPACITY LIMITED LITHIUM BATTERY SITE CLEARANCE FOR NPS
Ref: (a) NAVPGSCOL Monterey ltr 9310 Ser 00AA/329 of 24 Apr 15
(b) NOSSA ltr 8020 Ser N841/1239 dated 11 Aug 14
Encl: (1) NAVSURFWARCENDIV Crane ltr 8020 Ser GXSM/15028
of 29 Jun 15

1. In response to your request of reference (a), the Naval Ordnance Safety and Security Activity (NOSSA) extends the capacity-limited site clearance of reference (b) for lithium ion polymer batteries of less than 300 watt-hours energy capacity in various unmanned aerial systems, unmanned underwater vehicles, and robotics during research efforts by the Naval Postgraduate School, to include marine research vessels. Marine research includes operations involving research vessels from the University National Oceanographic Laboratory System (UNOLS), non-UNOLS marine vessels, buoys, and other marine platforms. The other provisions of reference (b) remain unchanged

2. This recommendation for your approval for use of these batteries is based on the safety review of enclosure (1). Naval Sea Systems Command (SEA-05Z34), Technical Warrant Holder for shipboard batteries concurs with inclusion of marine research aboard Navy-owned UNOLS vessels as documented in enclosure (1).

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3. The NOSSA point of contact is John Dow (N841), phone (301)
744-5640, or email: john.dow@navy.mil.

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Date: 2015.07.09 13:13:35 -04'00'

C. A. BACHELOR
By direction

Copy to:
NAVSURFWARCEN CARDEROCKDIV (Code 616/J. Simmons)
NAVSURFWARCENDIV Crane (GXS/M. Tisher)
NAVSEASYSYSCOM (SEA 05Z34/D. Cherry, J. Vignali)
NAVPGSCOL Monterey (S. Giles, D. Waxer)



DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE INDIANA 47522-5001

IN REPLY REFER TO:
8020
Ser GXSM/15028
29 Jun 15

FIRST ENDORSEMENT OF NPS ltr 9310 Ser 00AA/329 of 24 Apr 15

From: Commanding Officer, Naval Surface Warfare Center,
Crane Division
To: Commanding Officer, Naval Ordnance Safety and Security
Activity (N841)

Subj: REISSUE OF CAPACITY LIMITED LITHIUM BATTERY SITE
CLEARANCE FOR NAVAL POSTGRADUATE SCHOOL

Ref: (c) NAVSEAINST 9310.1B
(d) NAVSEA Technical Manual S9310-AQ-SAF-010, Batteries,
Navy Lithium Safety Program Responsibilities and
Procedures of 15 Jul 10
(e) NOSSA ltr 8020 Ser N841/1273 of 16 Jul 12
(f) NOSSA ltr 8020 Ser N841/1378 of 1 Aug 12
(g) NOSSA ltr 8020 Ser N841/1889 of 20 Oct 12
(h) NOSSA ltr 8020 Ser N841/2012 of 8 Nov 12
(i) NOSSA ltr 8020 Ser N841/157 of 29 Jan 13
(j) NOSSA ltr 8020 Ser N841/1185 of 29 Jul 13
(k) NOSSA ltr 8020 Ser N841/526 of 8 Apr 14
(l) NAVSEA 05Z34 (Mr. D. Cherry)/NSWC Crane (Mr. M.
Tisher) E-mail of 26 Jun 15

1. As requested in the basic submission, the Naval Surface Warfare Center, Crane Division (NSWC Crane), Energy, Power and Interconnect Technologies Division, Code GXS, has conducted a safety review for inclusion of marine research to the previous concurrence issued by reference (b). Reference (b) was for a capacity limited site clearance for lithium-ion batteries of less than 300 watt-hours energy capacity used in various unmanned aerial systems (UAS), unmanned underwater vehicles (UUV), and robotics systems during research efforts at the Naval Postgraduate School (NPS) located in Monterey, CA. Marine research would include operations involving research vessels from the University National Oceanographic Laboratory System (UNOLS), non-UNOLS marine vessels, buoys, and other marine platforms. The UNOLS fleet includes a mixture of Navy-owned and commercial vessels. This review was conducted in accordance with references (c) and (d).

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2. NPS personnel conduct diverse research efforts using a variety of small UAS, UUV and robotics systems. These systems typically use lithium-ion polymer batteries that are common commercially for use in radio control hobby vehicles such as Thunder Power. References (e) through (k) are previous approvals and extensions issued to NPS for various UAS applications used in flight testing. NPS has established a Standard Operating Procedure (SOP) based on the commonality of lithium polymer batteries used across these and other applications within the scope of their research activities and the hazards associated with their use. The SOP establishes safety guidelines for the selection, design, testing, evaluation, use, packaging, storage, transportation and disposal of lithium batteries at the activity. The SOP has been revised to include two new sections covering shipboard deployments and safety orientation. NSWCC Crane has reviewed this SOP and concurs with the documented approaches for mitigating potential battery failures. These approaches include the use of a lithium-ion specific charger with individual cell voltage monitoring and balancing, attended charging operations with separation from other personnel and materials, transport and storage of batteries, detailed inspection procedures including corrosion or other damage criteria for removing batteries from service, use of a flammable locker for storage and charging, and emergency response. The 300 watt-hour limit is based on the definition of a medium size battery as defined in special provision 189 in section 172.102 of 49 Code of Federal Regulations issued by the Department of Transportation.

3. NSWCC Crane recommends concurrence with the inclusion of marine research to the previous concurrence issued by reference (b). This recommendation is based on the reasonable battery size limit, use of a standardized procedure with appropriate mitigations against typical lithium ion polymer battery failure modes and behaviors and operator training to that procedure, safety briefing prior to shipboard deployments, safety orientation providing awareness of lithium ion battery hazards, and history of safe operations under previous concurrences.

4. NAVSEA 05Z34 has reviewed the documentation and concurs with the inclusion of marine research for a capacity limited site clearance for lithium ion batteries of less than 300 watt-hours energy capacity used in various UAS, UUV, and robotics systems

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during research efforts conducted by the NPS. Concurrence was provided via electronic mail given as reference (1).

5. NSWC Crane point of contact is Mr. Mark Tisher, Energy, Power & Interconnect Technologies Division, DSN 482-5912, or commercial 812-854-5912, or E-mail at mark.tisher@navy.mil.


DENEAN GILLENWATER
By direction



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IN REPLY REFER TO:
9310
Ser 00AA/329
24 Apr 15

From: President, Naval Postgraduate School
To: Commanding Officer, Naval Ordnance Safety and Security Activity (NOSSA) (N841)
Via: Commander, Crane Division, Naval Surface Warfare Center (GXS)

Subj: REISSUE OF CAPACITY LIMITED LITHIUM BATTERY SITE CLEARANCE FOR NPS

Ref: (a) NPS ltr 9310 Ser 00AA/623 of 16 Jul 14
(b) NOSSA ltr 8020 Ser N841/1239 dated 11 Aug 14

Encl: (1) NPS LiPo SOP Version 1.4A April 15

1. Reference (a) is the Naval Postgraduate School (NPS) request for Capacity Limited Lithium Battery Site Clearance covering unmanned aerial systems, unmanned underwater vehicles, robotics, and diverse research efforts. Reference (b) is the NOSSA concurrence with a capacity-limited site clearance for lithium ion polymer batteries of less than 300 watt-hours energy capacity in various Unmanned Aerial Systems (UAS), Unmanned Underwater Vehicles (UUV), and robotics during research efforts at NPS.

2. Reference (b) included verbiage in the clearance related to NPS and research operations under NPS supervision, conducted at controlled ranges and airspace at shore facilities.

3. NPS requests to have this limited safety approval reissued to confirm inclusion of marine research. This would cover operations involving research vessels from the University National Oceanographic Laboratory System (UNOLS), non-UNOLS marine vessels, buoys, and other marine platforms.

4. Enclosure (1) is the updated NPS Lithium Polymer Standard Operating Procedure which details all aspects of use, storage, and disposal. An Appendix G has been added to enclosure (1) to assist in this reissue specifically addressing marine research preparations, marine operations, and marine safety procedures. Participating researchers will receive training on enclosure (1) and be accountable for procedures in that document as well as restrictions delineated in the requested clearance reissue.

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5. We appreciate your expedited technical review. Any questions concerning this request can be addressed to Dr. Kevin Jones (831) 656-7711 or Mrs. Debora Waxer (831) 656-1072.



D. L. McLAY
Chief of Staff

Copy to:
NPS OSHE Directorate