



DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND
1333 ISAAC HULL AVE SE STOP 5214
WASHINGTON NAVY YARD, DC 20376-5214

In reply refer to

9254

Ser 05Z2/024

15 Feb. 2008

From: Commander, Naval Sea Systems Command
To: Commander, Naval Surface Warfare Center
Attn: Code 9443 (Mr. D. Ulmer)

Subj: NAVAL SHIPS TECHNICAL MANUAL, NAVSEA S9086-HY-STM-010/CH-231, CHANGE ALLOWING USE OF MULTI-JACKBOLT TENSIONERS

Ref: (a) NAVAL SHIPS TECHNICAL MANUAL, CHAPTER 231, PROPULSION AND SSTG STEAM TURBINES, NAVSEA S9086-G9-STM-010/CH-231 Rev.6, dated 1 Dec 2005
(b) NAVAL SHIPS TECHNICAL MANUAL, CHAPTER 075, FASTENERS NAVSEA S9086-G9-STM-010/CH-075 Rev 4, dated 1 March 2006

1. **Background:** Multi-jackbolt tensioners (MJBTs) can be a preferable substitute for nuts that are difficult to preload. Conventional fasteners are preloaded by tightening the nut which can be difficult when the fastener is large requiring a high preload, or if access is restricted. MJBTs are preloaded by extending the jackbolts through the nut body, which can be done using hand tools.

2. **NAVSEA Discussion:** Steam turbines have been identified as a potential application for MJBTs. Before reference (a) could be revised allowing use of MJBTs, reference (b) needed to be revised to include new applicable information pertaining to MJBTs. Reference (b) has recently been revised to include this information, summarized as follows:

a. A sentence was added stating that if minimum thread protrusion is not met, the bolt or stud shall be replaced with an identical but longer bolt or stud and the correct Technical Variance Document changes made.

Subj: NAVAL SHIPS TECHNICAL MANUAL, NAVSEA S9086-HY-STM-010/CH-231, CHANGE ALLOWING USE OF MULTI-JACKBOLT TENSIONERS

b. A new section was added specifying installation, removal, and retorquing procedures for MJBTs.

c. The MJBT source control drawing, NAVSEA drawing 075-7383799, is referenced. This drawing provides MJBT ordering information, sizes, and specific guidance on using, installing and removing MJBTs.

d. A sentence was added stating that MJBTs cannot replace covered nuts and copper washers used to prevent bolt-hole leakage. A sentence was added stating that "tall" profile series nuts with unthreaded lower portions used to distribute stress in the stud can only be replaced by MJBT/spacer combinations if shown to have approximately the same local stress distribution.

3. NAVSEA Action: NAVSEA approves the following changes made to reference (a) to allow the use of MJBTs on steam turbines.

a. Page iii, add "231-2.16" to the Paragraph Column, "FASTENERS" to the center column and "231-36" to the Page column.

b. Page 36, add the following:

"231-2.16 FASTENERS

231-2.16.1 Fasteners for steam turbines and their components are to be considered as part of the original design of those steam turbines and components. Multi-Jackbolt Tensioners are allowed to be used on steam turbines and their components as described in NSTM 075, Fasteners, Revision 4. Also, see section 231-8.7 for additional fastener and torquing information."

c. Page 139, after "231-8.7 MAKING UP TURBINE CASING BOLTING" add the following note: "Note: If multi-jackbolt fasteners (MJBT) are being used some of the information in this section is not applicable. Consult Naval Ships Technical Manual, Chapter 075, FASTENERS and NAVSEA drawing 075-7383799 for further information on MJBTs".

Subj: NAVAL SHIPS TECHNICAL MANUAL, NAVSEA S9086-HY-STM-
010/CH-231, CHANGE ALLOWING USE OF MULTI-JACKBOLT
TENSIONERS

4. The NAVSEA technical point of contact for this item is
Mr. Tom Armstrong (202-781-3762) NAVSEA 05Z23 or John
Treptschko (202-781-3814), NAVSEA 05Z24.



J.P. Engel
By Direction

Subj: NAVAL SHIPS TECHNICAL MANUAL, NAVSEA S9086-HY-STM-010/CH-231, CHANGE ALLOWING USE OF MULTI-JACKBOLT TENSIONERS

Blind copy to:

CONCURRENCE

DATE

Via Livelink:

SEA 05Z2 (Farino)
SEA 05Z22 (Trepatschko)

SEA 05Z22 John Trepatschko 10/2/06

xc:

SEA 08T (Connolly)
SEA 07T23 (Kurz)
PMS 312 (Vannederynen)
NSWC (Jennings)

SEA 05Z2 E. Farino 10/2/06

SEA 07T23 Mark W/A 11/27/06

PMS 312 P. Mal 1/8/07

SEA 08T R. Connolly 2/6/08

Record Note:

This letter accepts Multi-Jackbolt Tensioners, such as Super-Bolts in specific applications on Naval Steam Turbines.