# APPENDIX I: FSRU NAVIGATIONAL EQUIPMENT AND PERSONNEL REQUIREMENTS

## FSRU Navigation Equipment and Personnel Requirements

### Navigation and Communications Equipment

The FSRU should be fitted with navigation equipment similar to what would be found on a typical large commercial vessel operating on Long Island Sound. All of the installed navigation equipment shall be type approved[1] and shall be capable of being energized from the FSRU's emergency power source. Based on the navigation equipment requirements for ocean going ships, the FSRU should be filled with the following:

- A 9-GHZ radar and a 3-GHZ radar capable of being operated independently of the other;
- An automatic radar plotting aid, e.g., ARPA;
- A gyro-compass and repeaters suitable for taking bearings;
- A transmitting heading device or other means of transmitting heading information for input to the required navigation equipment;
- An automatic identification system (AIS);
- A global navigation satellite system, e.g., GPS;
- Appropriate charts (paper or electronic with backup) to monitor the position of the FSRU;
- A rate of turn indicator, or other means, to determine and display the FSRU's rate of turn around the yoke mooring; and,
- Radio equipment meeting the requirements of SOLAS Chapter 4, Regulations 7 and 8.

### FSRU Personnel Requirements

Insofar as the proposed location of the FSRU is in the vicinity of a thoroughfare, it is essential that the unit have personnel assigned who are responsible for monitoring vessels transiting the area in order to evaluate the risk of allision and to take appropriate actions to alert another vessel if it is determined that the risk of allision does exist. In addition, the FSRU's crew must include personnel who are competent to oversee marine related activities, including the mooring and unmooring of LNG carriers and cargo operations. The FSRU's crew should include:

- A Superintendent responsible for all aspects of FSRU's operations;

[1] U.S. Coast Guard requirements for approved navigation equipment are addressed is Navigation and Inspection Circulars 08-01 and 02-03.

- A Mooring Master, or Marine Superintendent, meeting the requirements outlined in Resource Report 11[2], who shall be in charge of all navigation related duties and responsibilities, including supervising members of the navigation watch;
- Three vessel traffic watch standers[3] who hold a current Coast Guard merchant mariners license authorizing service as at least Mate of ocean steam or motor vessels of any gross tons, endorsed as a radar observer, or as Master or Mate of ocean steam or motor vessels of limited tonnage, endorsed as a radar observer and endorsed as a Federal First Class pilot on the waters of Long Island Sound.[4] While on duty, the navigation watch will be responsible for monitoring the movement of vessels transiting in the vicinity of the FSRU for the purpose of evaluating the risk of allision and to take all appropriate actions to prevent another vessel from alliding with the FSRU. In addition, they will be responsible for launching the FSRU's lifeboats. The navigation watch shall consist of at least one person on duty for not more than 15 hours in any 24 hour period and for more than 36 hours in any 72 hour period, except in an emergency; and,
- A Cargo Transfer Supervisor and a Cargo Transfer Assistant Supervisor who meet the requirements outlined in Resource Report 11.

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[2] This individual will be serving under the authority of their Coast Guard license as a condition of employment and hence can be the subject of Coast Guard Suspension and Revocation proceedings under the authority of 46 C.F.R. § 5.57.

[3] This requirement is in lieu of the Vessel Traffic Supervisor discussed in Resource Report 11 of Broadwater Energy's application to FERC.

[4] These personnel will be serving under the authority of their Coast Guard license as a condition of employment and hence can be the subject of Coast Guard Suspension and Revocation proceedings under the authority of 46 C.F.R. § 5.57.