d) Parameters that will be measured at the beginning of and during the test, in each run. What are the dependent and independent variable parameters that will be measured? For example, will the buff and draft forces on the tender car be measured and how this will be reported?

In 5 minute intervals, FECR will electronically measure:

- Tender volume
- Tender pressure
- Gas temperature
- Pump speed
- Gas discharge pressure
- Glycol supply/return temperature
- Gas flow rate

Additionally, the request for gas from the locomotive and the Tender acknowledgment of request (handshake) will be recorded for each instance during each test run. The substitution rate and volume of both diesel and natural gas will be monitored for each run.

Excessive buff and draft force alarms are currently being captured for all FECR locomotives through the WiTronix onboard remote monitoring system. The Tender is equipped with a similar WiTronix device which will record excessive forces in both longitudinal and vertical orientations.

e) Details of the appurtenances (valves, breakaway connections, pipes, safety systems) on the tender and how they are protected against impact forces.

FECR shall protect the LNG plumbing appurtenances with Klaw breakaway closure devices currently used in large volume marine transfer service. A mechanical impact to a Klaw breakaway results in LNG flow being terminated in both directions. Breakaway devices are located on all penetrations into and out of the ISO container, with the exception of the vent relief system.

f) In the LNG tender will the cryogenic pumps be operated exclusively to pump LNG through the heat exchanger/vaporizer? Will there be operations with both pumps and internal vapor pressure generated head for the flow? If so how will the performance of the cryogenic pump (at different loads) be tested? What situations would form the baseline of operation with pumps alone? What is the target operating pressure inside the tank?

It is FECR's desire to not saturate the LNG to a greater level than is necessary by a continuous pump operation, as this will add heat to the LNG and shorten the hold time in the Tender. The sole function of the single internal pump is to drive LNG to the two vaporizers. Further analysis during Phase 2 testing is required to fully understand the exact requirements of the pump and relationship with the locomotive(s). Ideally, the target pressure shall be to maintain and deliver an uninterrupted supply of gas volume to two locomotives in notch 8 at a nominal pressure of 120 psig. In order to maintain sub-cool to hold pump prime, “intermittent pressure building” may be required during pump operation.