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FERC
Margalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

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Re: Docket No. PF06-11-000

Dear Ms. Salas,

This submission is based on the published best practices standards for the LNG industry as established by the Society of International Gas Terminal and Tanker Operators (SIGTTO). The SIGTTO standards should be familiar to FERC, since SIGTTO's General Manager James A. MacHardy sent FERC a letter offering assistance on 2004 May 26. (See accompanying file, "SIGTTO_Letter2FERC.pdf".)

Since the SIGTTO membership is comprised entirely of gas/LNG industry participants worldwide — including nearly all of the participants in LNG industry — SIGTTO's best practices standards are recognized by the LNG industry in the United States and worldwide as the ultimate standards.

The SIGTTO best practices standards demonstrate the fatally-deficient siting of Quoddy Bay LLC's proposed LNG terminal. Further, there is no location within Passamaquoddy Bay or its tributaries where an LNG terminal could be properly sited.

The SIGTTO letter states, among other things:
[NOTE: Bold emphasis has been added throughout the quotes cited in this filing, .]

"The Society of International Gas Tanker and Terminal Operators [SIGTTO] was formed in 1979 to encourage safe and responsible operation of liquefied gas tankers and marine terminals handling liquefied gas; **to develop advice and guidance for best practice** among its members and **promote criteria for best practice to all who have responsibilities for, or an interest in, the continuing safety of gas tankers and terminals."**

"At the end of 2003 **SIGTTO members own and/or operate over 91% of the world's LNG terminal capacity** with 17.7million m3 **and 92% of the 152 LNG carriers in service.** Furthermore virtually all of the 24 LNG carriers due for delivery during 2004 will be either owned or operated by SIGTTO members."

"SIGTTO is willing to work with FERC in whatever way to reach a better

understanding of the safe and efficient operation of carriers and terminals designed to handle LNG."

Since FERC is familiar with SIGTTO and the existence of LNG industry standards of best practices, and since the vast majority of LNG operators are members of SIGTTO and subscribe to its standards, then FERC should be aware that Quoddy Bay LLC's project in Passamaquoddy Bay cannot be made to comply with those industry standards.

SIGTTO & IAMU

The International Association of Maritime Universities (IAMU) helps SIGTTO establish its industry standards. The North American teaching institutions that are members of IAMU are:

- California Maritime Academy
- Fisheries and Marine Institute of Memorial University of Newfoundland
- Maine Maritime Academy
- Massachusetts Maritime Academy
- State University of New York Maritime College
- Texas A&M University at Galveston
- U.S. Merchant Marine Academy

SIGTTO VIOLATIONS ILLUSTRATED

The accompanying file, "Waterway.pdf", contains nautical charts illustrating the SIGTTO violations. The charts contain the carrier route, as provided by one of the local navigational pilots, and as published in *"Preliminary Navigations/Waterways Analysis and LNG Safety Review for LNG Receiving Terminal at Point Pleasant* [sic]*, Maine"* prepared for Quoddy Bay LLC by TRC.

LNG TERMINAL SITE SELECTION & OPERATION

...the terminal may remain exposed to **risks arising as a consequence of intrusions, accidental or otherwise, into the environs of the berth by other vessels operating in the port.**

These risks must first be assessed at the design and **site selection stages of a terminal's development.**[1]

The process of **site selection** (for the terminal) **should address a site's exposure to intrusion from other craft** using the port....[2]

UNACCEPTABLE LNG SPILL RISK SIGTTO STANDARD

According to SIGTTO **there is no "acceptable risk" for a large release of LNG, no matter how small the odds.** Risk-calculation formulae in the matter of large LNG

[1] *LNG Operations in Port Areas*, Society of International Gas Tanker and Terminal Operators Ltd., 2003, ISBN: 1 85609 256 9, p7.

[2] *ibid.*

release are irrelevant. **SIGTTO disallows even the smallest risk of a large LNG release.**

> As described in risk assessment theory, operational solutions are found by acceptance, or non-acceptance, of some categories of risk. However, whatever remote frequencies may be tolerated for smaller release, **there is no acceptable frequency for a large release.**[3]

Since no large release is acceptable at any odds, LNG terminal siting should be situated such that large release probability is no more than zero.

The FERC should adhere to the SIGTTO standard when considering this LNG project. The infrequency of LNG incidents in the world and this country may be largely attributed to SIGTTO best practices standards. To ignore these standards would risk safety of American citizens, Canadian citizens, the product and facilities, industry credibility, and our nation's energy security.

LNG TERMINAL PIER & JETTY SITING, & PORT DEVELOPMENT

Siting of an LNG jetty and pier must be such that other port traffic — including other traffic transiting to another nearby port — cannot pose a collision threat to a berthed LNG tanker or LNG facilities. The narrow passages of suitable depth within Western Passage, Passamaquoddy Bay, and the Saint Croix River preclude the siting of an LNG terminal in these locations. Further, the close proximity of civilian population and civilian assets at Sipayik (Pleasant Point Passamaquoddy Reservation), Carlow Island, and Clam Cove, New Brunswick, Canada, also preclude siting an LNG terminal at the proposed Split Rock location. SIGTTO mentions no fewer than 31 times that siting a terminal in a location such as proposed by Quoddy Bay LLC is unacceptable.

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> ...the references mentioned in chapter 6 direct port designers to construct jetties handling hazardous cargoes in remote areas **where other ships do not pose a (collision) risk.** and where any gas escape **cannot** affect local populations.[4]
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> **The recommended site selection process removes as many risks as possible by placing LNG terminals in sheltered locations remote from other port users.** References [6], [7] and [8] all direct port designers to **construct jetties handling hazardous cargoes in remote areas where other ships do not pose a (collision) risk and where any gas escape cannot affect local populations.**[5]
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> **Jetty location should also be chosen to reduce the risk of passing ships striking a berthed LNG carrier....**[6]
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> **...LNG tankers are vulnerable to penetration by collisions with heavy displacement**

[3] *Site Selection and Design for LNG Ports and Jetties,* Information Paper No. 14, Society of International Gas Tanker and Terminal Operators Ltd., 2004, ISBN: 1 85609 129 5, p4.

[4] *op. cit.*, p5.

[5] *op. cit.*, p6.

[6] *op. cit.*, p7.

ships at all but the most moderate of speeds. Such incidents ought to be treated as credible within any port where heavy displacement ships share an operating environment with LNG tankers.[7]

...large ships passing near to a berthed LNG carrier can cause surging or ranging along the jetty, **with consequential risks to the moorings** and this phenomenon should be guarded against. This can occur at **jetties located in channels used by large ships** and, because of this, **these positions are not recommended.**[8]

...site selection is directed mainly at minimising the risks of ship strikings, limited interactive effects from passing ships and reducing the risks of dynamic wave forces within mooring lines.[9]

Additional specific criteria are also found from risk factors lying beyond normal operations at the ship/shore interface. **These conditions can include hazards from outside influences such as other marine traffic** and nearby ignition sources.[10]

Essential design for a safe LNG jetty

• **provide a safe position, removed from other traffic and wave action**[11]

If large ships are allowed to pass close by, interactive effects can cause mooring line failure on the LNG carrier. ...such locations are not recommended....[12]

Because of the unquantifiable nature of the human element, this paper suggests that **only by removal of all possibilities for containment system penetration can the correct level of port security be obtained.**[13]

...when designing a port, the aim should be to limit the probability of high energy impacts on LNG carriers....[14]

Jetty location should be remote from populated areas and should also be well removed from other marine traffic.

...**narrow channels should not be considered as appropriate positions for LNG carrier jetties.**[15]

The most important single determinant of risk attached to LNG operations in port

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[7] *LNG Operations in Port Areas*, Society of International Gas Tanker and Terminal Operators Ltd., 2003, ISBN: 1 85609 256 9, p2.

[8] *Site Selection and Design for LNG Ports and Jetties,* Information Paper No. 14, Society of International Gas Tanker and Terminal Operators Ltd., 2004, ISBN: 1 85609 129 5, p7.

[9] *op. cit.,* p7.

[10] *op. cit.,* p8.

[11] *op. cit.,* p12.

[12] *op. cit.,* p14.

[13] *op. cit.,* p16.

[14] *op. cit.,* p17.

[15] *op. cit.,* p24.

areas is the selection of the site for the marine terminal — the location of the tanker berth(s).[16]

...no site should be selected for an LNG terminal **that produces unavoidable potential threats** to the security of its associated tanker operations thereafter, **for as long as the terminal will operate....**[17]

Ideally **LNG marine terminals should be sited away from port fairways used by other ships.** The most effective form of protective location is one **where there is no possibility of other ships approaching and threatening the security of moored LNG tankers....Even when protected from the threat of approaching ships, the berth ought also to be free from wave effects generated by passing traffic.**[18]

...whatever the prevailing circumstances, **no terminal should be sited in a position that admits the possibility of its being approached by heavy displacement ships,** having an inherent capability for penetrating the hull of an LNG tanker.[19]

All port traffic, irrespective of its potential to inflict damage on gas assets, presents an ignition risk.[20]

Locations that already attract other craft, including pleasure craft and fishing vessels, are inherently unsuitable for LNG terminals. In such circumstances **enforcement (of the exclusion zone) is highly problematical and, even with strenuous enforcement effort, may ultimately fail.**[21]

Ports have dynamic environments; the pattern of their operations changes over time and with that the profile of their operational risks also change. Hence, **a site selection process,** conducted with a careful consideration of the risks posed for LNG operations, **can later be confounded by subsequent developments, long after the LNG operation is established.**[22]

Ideally the site selected will be one whose operations remain indifferent to subsequent developments within a port.[23]

It is essential that all terminals designated for the transfer of LNG fully comply with recommended criteria. To do otherwise needlessly increases the risks of interface failure and consequential release of LNG.[24]

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[16] *LNG Operations in Port Areas,* Society of International Gas Tanker and Terminal Operators Ltd., 2003, ISBN: 1 85609 256 9, p17.

[17] *ibid.*

[18] *ibid.*

[19] *op. cit.,* p20.

[20] *ibid.*

[21] *ibid.*

[22] *op. cit.,* p22.

[23] *ibid.*

[24] *op. cit.,* p23.

The most common potential threat being posed by the intrusion of other port traffic. [25]

Potential threats emanating from external sources should be eliminated from the basis of design and in the **selection of the terminal site.**[26]

Further, the passage to the proposed LNG terminal contains significant risks. There are at least four locations along the fairway that offer hazardous rock outcrops: three within Head Harbour Passage and two in Western Passage (Clark Ledge and Dog Island). **Dredging would not be sufficient to remove these hazards.**

An additional hazard, a type that SIGTTO doesn't address, is Old Sow Whirlpool. According to the pilot who provided Quoddy Bay LLC's preliminary waterway study with the shipping route for the proposed LNG tankers, avoiding the whirlpool requires transiting ships to hug the Eastport shore (the "choke point" referred to in Quoddy Bay LLC's preliminary waterway suitability study, which the study indicates is necessary in order to avoid Old Sow Whirlpool) near Clark Ledge and Dog Island. It should also be noted that this location of Eastport is a residential area.

Hence, by removing individual risks in each port such as:
- **rock outcrops or reefs**
- underwater obstructions, and
- **close encounters with other ships**

from the main shipping channels and their immediate environs, port risks can be reduced to a level where a large release of LNG becomes too remote to imagine.[27]

While SIGTTO suggests removing these risks, the practicality of doing so is in question, especially since dredging would not be sufficient, and since it would require permission from the Canadian government to remove the two ledge risks in Head Harbour Passage.

NAVIGATION, CHANNEL

Short approach channels are preferable to long inshore routes which carry more numerous hazards.[28]

The **width of the channel,** too, should be examined throughout its length to confirm that it provides **adequate navigable water in all credible operational contingencies.** [29]

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[25] *ibid.*

[26] *op. cit.,* p28.

[27] *Site Selection and Design for LNG Ports and Jetties,* Information Paper No. 14, Society of International Gas Tanker and Terminal Operators Ltd., 2004, ISBN: 1 85609 129 5, p18.

[28] *op. cit.,* p23.

LNG UNLOADING HAZARD
SIGTTO advises that, due to ignition, ship strike, and wake hazards, no ships pass nearby while LNG is being pumped from a ship to the terminal. Following such advice — since Quoddy Bay LLC proposes that a ship be in port at all times — would almost permanently preclude any other traffic in Western Passage, including traffic to ports upriver from Quoddy Bay LLC's terminal.

1) Ships passing to the port of Bayside, New Brunswick, Canada would be permanently disallowed.
2) It also possibly means that all fishing vessels and pleasure craft would be permanently precluded from using Western Passage.

Ship movements by nearby ships, when the LNG carrier is pumping cargo, should be disallowed.[30]

CONCLUSION
The SIGTTO best practices standards were developed over many years in order to maintain safety and credibility within the gas/LNG industry. Violation of those standards would risk both, inviting injury to the industry and to this country's energy security.

The proposed Quoddy Bay LLC terminal in Western Passage at Split Rock does not meet SIGTTO's LNG industry best practices, and cannot be made to do so without severe environmental consequences. Therefore, due to the inability for the project to conform to industry best practices standards, the FERC should reject Quoddy Bay LLC's proposed project.

Very truly,

Robert Godfrey

[29] *LNG Operations in Port Areas,* society of International Gas Tanker and Terminal Operators Ltd., 2003, ISBN: 1 85609 256 9, p12.

[30] *Site Selection and Design for LNG Ports and Jetties,* Information Paper No. 14, Society of International Gas Tanker and Terminal Operators Ltd., 2004, ISBN: 1 85609 129 5, p24.