

INTERFACE CONTROL DOCUMENT

for the

**TRAFFIC LIGHTS AND EMERGENCY
COMMUNICATIONS SYSTEM AT GRETNA
AND GOVERNOR NICHOLLS TRAFFIC
LIGHT FACILITIES**

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1.0 SCOPE

1.1 Scope

The purpose of this Interface Control Document (ICD) is to define the functional characteristics required to exist to ensure compatibility between Gretna and Governor Nicholls Light facilities and the Vessel Traffic Center (VTC) at New Orleans, Louisiana. This system interface diagram consists of six interfaces as shown in figure 1.0.

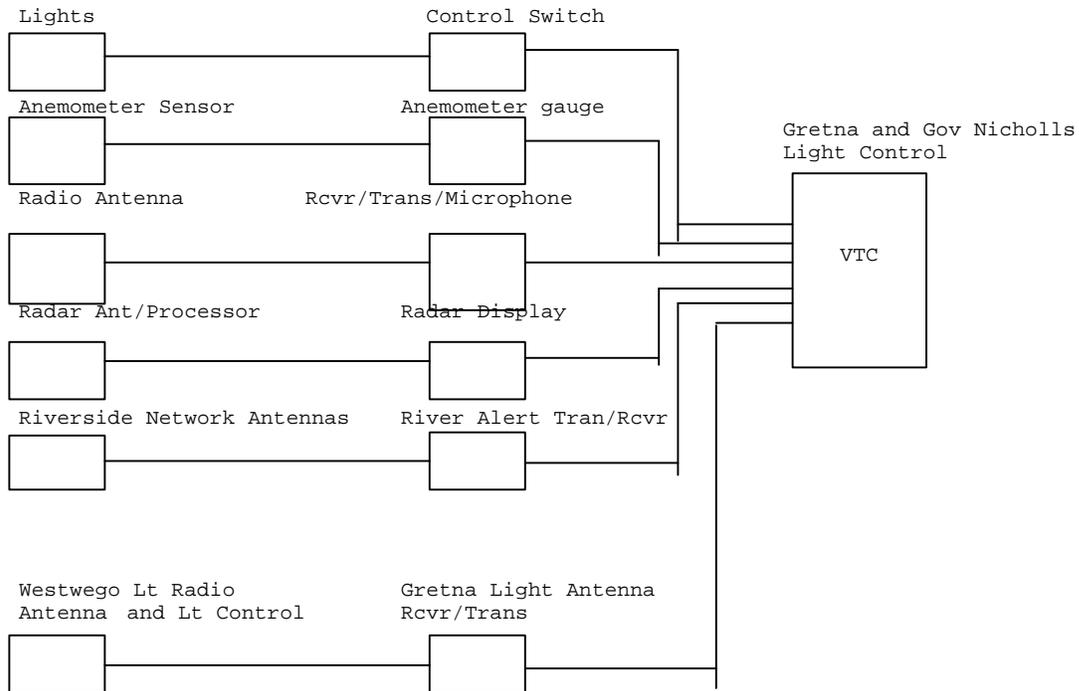
1.2 System Overview

At present, no VTS exists in New Orleans, however, Gretna and Governor Nicholls Light facilities are two manned shore side facilities mounted in critical areas on the banks of the Mississippi River in the port of New Orleans, Louisiana. From these "Lights," operators communicate to vessels transiting these areas, thus assisting in safe passage in the vicinity.

The Coast Guard will continue to provide the services currently offered at Gretna Light and Governor Nicholls Light, with control thereof remoted from the VTC. Operators will no longer be needed at the "Lights."

To accomplish the task of ensuring safe passage, the operators who staff the light facilities 24 hours a day, employ their eyesight through use of binoculars, as well as equipment such as VHF radios, radar, telephones, and facsimile machines. In addition, they operate controls which operate traffic lights that provide signals to vessels transiting up and down the river.

FIGURE 1.0 SYSTEM DIAGRAM



2.0 Applicable Documents

None.

3.0 REQUIREMENTS

The requirement is to remote the control of Gretna Light and Governor Nicholls Light from their present on site locations to the VTC, as well as receive other Gretna and Governor Nicholls sensor data at the VTC in New Orleans. This effort requires remoting control of the lights, remoting the anemometer data, and relocation of the MDC-1200 radio for the Remote Alert Network. Interfaces between the VTC and the light facilities shall provide the capability to turn on and off the traffic lights, enable the transmission and reception of radio communications, the reception of anemometer information, and the transmission of an alert signal, and the receipt of an acknowledgment via the Remote Alert Network.

The remainder of this document provides the details associated with each of the above mentioned interfaces.

3.1 LIGHT INTERFACE

The lights at Gretna and Governor Nicholls are powered by a 110V volt feed to a 12 Volt transformer which supplies the signal light. The transformer essentially steps down the voltage and provides non regulated power through a bridge rectifier to power the lights via the control of a three way wall type switch.

There are no status indicators to show when the lights are on, off or if a bulb has blown. There is only one filament in each light. Operators at both light facilities verify that the lights are on/off by calling each other (e.g. the Governor Nicholls operator calls Gretna, and vice versa). Governor Nicholls Light is particularly difficult to see due to its tall tower and the absence of reflectors. Additionally, ships call the operators to confirm the light status. If a bulb burns out, the operator informs the Marine Safety Office (MSO) who sends a technician to replace the bulb.

3.2 RADAR INTERFACE

Presently both Gretna light and Governor Nicholls Light have AN/SPS-69 radars with 4 foot antennas in a Transmitter/Receiver up configuration with a small radar display in the operator's room. The radars at both Light facilities will be replaced by the System Integration Contractor as part of the VTS implementation. Therefore, an interface requirement will not be addressed in this document.

3.3 RADIO INTERFACE

Current radios used at Gretna light and Governor Nicholls Light are "Sea 156 VHF/FM radios. It is probable that the current radio antenna sites and/or radio antennas will not be reused at Governor Nicholls and Gretna Lights.

3.4 WESTWEGO LIGHT INTERFACE .

Westwego is an unmanned light platform that is monitored and controlled from Gretna Light. A small building is located on the platform at Westwego Light tower that houses VHF communications equipment, and the light controls. Control

is achieved via a MSF-5000 VHF marine station that links Westwego Light to Gretna Light. A Comtegra console is used to program wildcard/option functions that permit the operator to control Westwego Light as well as to remotely transmit/receive at Westwego Light from Gretna Light. Details of the implementation are provided in Appendix B.

3.5 ANEMOMETER INTERFACE

An anemometer sensor is mounted on the tower at both Light facilities, and the signal is routed to the operator workstation where temperature, windspeed and direction are displayed on a "Davis Weather Wizard III" anemometer display.

The "Davis Weather Wizard III" is a unit that can remotely display information to a maximum distance of 300 feet. In order to retain the anemometer capabilities at Gretna and Governor Nicholls lights, an anemometer system or a design scheme that is capable of being remoted to the VTC shall be procured and installed.

3.6 RIVER ALERT SYSTEM

A River Alert System is a community of alert radios that operate on 800 Mhz to alert selected entities to the possibility of an emergency in the waterfront area. These entities include The Delta Queen River Company, the Harbor Police, River Walk, One River Place, the Hilton, and the Aquarium of the Americas.

When the operators detect an emergency, the Governor Nicholls Light operator transmits a signal, which is broadcast to the above stated entities. The transmit signal is a Motorola MDL-1200 (1200 baud) format signal. The MDL-1200 is a conventional radio that is activated through a paging system. The system operates as a two way paging system which broadcasts a coded signal to alert receiving radios at the above entities along the river. Upon receiving the alert signal, the Harbor Police, acknowledges the signal, and takes appropriate civil action to deal with the emergency.

The antenna for the network is mounted on Governor Nicholls tower, and aimed at the river bend where the repeater is located.

In order to transition from Governor Nicholls Light to the VTC the only requirement is to relocate the Governor Nicholls radio and antenna.

3.7 ENVIRONMENTAL REQUIREMENTS

Table 1.0 illustrates the extremes of climatological and other environmental parameters within which the sensors that are being interfaced must operate, or be environmentally controlled.

Table 1.0 ENVIRONMENTAL REQUIREMENTS

	OPERATIONAL
Temperature	-25 to 50 deg C
Humidity	20% to 100% condensing
Wind Speed	65 knots sustained, 140 knots gusts
Weather	Rain, fog, snow, sleet, freezing rain, other conditions that affect visibility
Other	Salt spray, sand, dust, static discharge, vibration and shock

4.0 QUALITY ASSURANCE REQUIREMENTS

The Contractor shall implement, manage, and maintain quality and test programs that comply with the VTS requirements for interface control as required by this document, the VTS system specification and the Statement of Work for the VTS System Integration Contractor.

The Contractor shall provide assurance through test and evaluation that each system will provide the capabilities and capacities required by the VTS specification. Configuration control shall be rigidly enforced so that each system meets the interface requirements.

5. 0 PREPARATION FOR DELIVERY

Not applicable.

6. 0 NOTES

APPENDIX A: List of Acronyms

COTS	Commercial Off-The-Shelf
DSC	Digital Selective Calling
ICD	Interface Control Document
MSO	Marine Safety Office
NOLA	New Orleans, Louisiana
PAWSS	Ports and Waterways Safety System
SIC	System Integration Contractor
USCG	U.S. Coast Guard
VHF-FM	Very High Frequency - Frequency Modulation
VTC	Vessel Traffic Center
VTS	Vessel Traffic Service

APPENDIX B: Gretna, Louisiana to Westwego, Louisiana radio and light control link

The Coast Guard removed the T5600 console that used to control the base station in Westwego, and replaced it with a new Comtegra (Motorola) console with a gooseneck microphone and foot switch. This console is used to control the VHF radio as well as the navigation lights in Westwego.

All radio and light controls are linked via a UHF radio link. There are buttons on the Comtegra for 4 frequencies, 2 lights, transmit, volume, and programming access. Any button that is pushed requiring a VHF radio response will key the UHF link via the M lead option built into the console. The control function tones are 40 msec. tones that activate various functions in the MSF 5000 (Motorola) VHF radio. The tones are as follows:

- 2175hz = keying tone or guard tones
- 1950hz = F1 (channel 12) 156.600mhz
- 1850hz = F2 (channel 67) 156.375mhz
- 1350hz = F3 (channel 77) 156.875mhz
- 1250hz = F4 (channel 88) 157.425mhz
- 0950hz = WC1 relay for 1 watt TX power
- 0850hz = WC1 relay for 10 watts TX power
- 1150hz = WC2 relay for green light on
- 1050hz = WC2 relay for green light off
- 1550hz = WC3 relay for green/ red light on
- 1450hz = WC3 relay for green/ red light off

The console has date, time (12 or 24hr modes), alias channel names and various expansion buttons currently not used. The HLG 2175 hz tone has been programmed for 400msec to allow link key and stabilizing time. This is critical, for the normal 120 msec time will not pass the function tone that follows. Actually 300 msec would work but additional time has been added for assured timing.

The UHF link represents a 4 wire phone line. It is currently a Xtal type link soon to be replaced with the synthesized link. It operates on 407.625mhz and 415.625mhz with a private line subaudible tone of 103.5 (code 1A). Anytime the console keys, it transmits to Westwego. Any time Westwego receives, it transmits to Gretna. The Gretna end of the link is half duplex and the Westwego end is full duplex. This is so that Gretna can override a received signal and switch to the opposite direction in Westwego.

The Westwego tower is a 20' tower with a platform 9'5" square. A 4x6 fiberglass building is installed on the

platform to house all electronic equipment. The WC1 relay of the MSF-5000 VHF base operates a set of RF relays that take the 3db attenuator output (15 watts) and switches in and out an additional 10 db attenuator. This outputs to the antenna either 1 watt or 10 watts. The WC2 and WC3 relays switch 12vdc to the 120vac light relays, which in turn provide the dc power supplies to power the revolving lights. There is expansion room for 1 more relay on the wildcard board. The UHF link, the 2 light power supplies, and lightning protection equipment has all been mounted on a board on the inside wall of the building. The building has overhead lights and a 3500 BTU air conditioner. The controlled air in the summer months will greatly add to the life of the equipment as well as keep levels and settings stable.

The Coast Guard plans to add UPS units to power all equipment in the Westwego site as well as all the link and console at Gretna. Details of all power requirements are forthcoming and will be added to this document.