

Northern California Regional Information Security and Communication System (NorCal-RISCS)

NorCal-RISCS Executive Summary

The Northern California Captain of the Port Zone (COTP) reaches from the Oregon/California border to Point Conception near San Luis Obispo covering 600 miles of coast line and more than 1500 miles of inland waterways. Within this area are a vast number of maritime interests ranging from commercial container ships in the Pacific-rim trades, crude oil tankers from Valdez to the sensitive marine sanctuaries such as Monterey Bay and the Farallon Islands. No less important, are the fishermen and barges operating along the coast in Humboldt Bay, as well as recreational boaters and personal watercraft. It is also a region of great economic resource with the economic center being the ports in the San Francisco Bay. Within the region is over a 1000 miles of waterway and more than 200 miles of deep-water channels serving seven municipal ports and eighteen privately owned ports. The primary port of entry for containers is the Port of Oakland. As the fourth largest container port in the United States, it serves more than 30 major shipping lines and alone is responsible for nearly \$24 billion in annual trade, directly supporting an estimated 16,500 jobs. All the other San Francisco Bay ports combined provide additional billions of dollars in cargoes such as crude oil, automobiles, bulk cargoes and support for countless more jobs and tax revenue directly and indirectly. Another part of the economic engine that drives the San Francisco Bay Region is the passenger ferry industry. Approximately six million commuters and tourists alike are conveyed on ferries in the bay to their jobs or other points of interests and that number is expected to increase by more than 5-6 times in the near future. Lastly, there are several key bridges in the region, one such as the Golden Gate Bridge is a national icon and many others such as Oakland/San Francisco Bay Bridge are critical to the movement of goods and people. When added up, the Northern California region is a key contributor to both the local and national economy and as demonstrated by the recent labor disruptions, any extended delay in the movement of goods or threat to the safety of people would quickly translate to losses in the billions to the nation as a whole. It is the purpose of this document to request funding for a regional information system to provide a tool for the U.S. Coast Guard and other homeland security agencies in addressing potential terrorist activity. The information system will also assist the attending agencies to respond to any incident in a manner that best accommodates a safe and efficient restart of port maritime operations.

A Sub-committee of the Northern California Marine Transportation System, called the San Francisco Maritime Information System Committee (SF-MIS), was formed from a broad constituency of port stakeholders in the Northern California Region. The committee is comprised of individuals from organizations representing **land-based interests** such as port and terminals operators, **water-based interests** such as vessel and tug operators, bar pilots and ferry operators, **government agency oversight interests** such as the Coast Guard Vessel Traffic Service, Marine Safety Office, U.S. Customs, local law enforcement and **response organizations** such as HAZMAT, fire departments and oil spill response organizations.

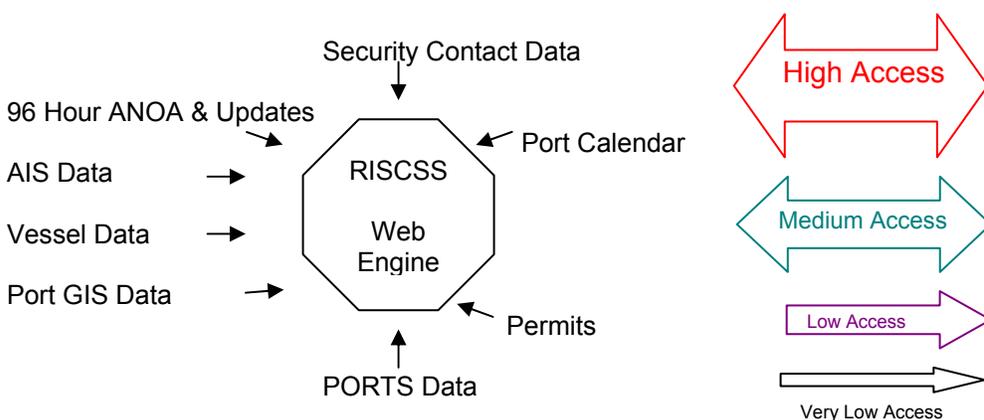
The primary mission of the subcommittee is to address the unique needs of the region as they relate to port security and maritime domain awareness and to provide recommendations for the design of the Northern California Regional Information Security and Communication System (NorCal-RISCS). This document is a concept design with the goal to integrate, communicate and support the local knowledge and experience of the region, with that of national interests, on a single platform. The SF-MIS Committee has determined that the NorCal-RISCS would best serve the region to achieve the highest level of security preparedness by using proven and available technology with the least amount of interruption in the movement of goods and people.

NorCal-RISCS System Introduction

The NorCal-RISCS is comprised of four major components. The first is the web based engine designed to handle multiple secure data entry points such as the 96 hour Advanced Notice of Arrival (ANOVA) that can be delivered via vessel, agent and local Marine Exchange. The second is a large relational database that can handle the organization of static information such as vessel characteristics and geographic port information, as well as dynamic information such as vessel movement data. Additionally, this database is designed to integrate with other existing systems such as the Automated Information System (AIS) and the Automated Secure Vessel Traffic System (ASVTS) for the purpose of situational awareness. The third component is a graphical user interface (GUI), both web based and a virtual private network (VPN), that is flexible enough to allow multiple displays to facilitate the needs of the port stakeholders based on their level of security. This interface will support data from multiple feeds such as a situational data, displaying the real-time status, dynamic and static (including response capability) of all vessels in the geographic region either in transit, docked or anchored. It will also support the distribution of surveillance camera feeds to the approved agencies. The fourth component is a communications hub that will address the issues related to the collection and dissemination of information. One example is the distribution of changing MARSEC levels in a push fashion to either all or pre-selected individuals responsible for security response in the region. This information will be handled in a secure manner from and to the appropriate third parties via Internet and wireless communication to allow for the best response of assets to mitigate all conceivable incidents. This communication hub will also provide a web based means of communication for low security information such as a calendar for port stakeholder meetings, Coast Guard information and license processing, recreational boater permit applications, real time weather and tide information, an extensive web links page and a port directory for important information.

NORCAL-RISCS Web-engine

The key to any successful system is delivery and input of timely and accurate data. Some information is static (rarely or occasionally changes) and some is dynamic (constantly changing). The NORCAL-RISCS web engine is designed to address both of those requirements on a common platform that is readily available, i.e. the Internet (Fig.1).



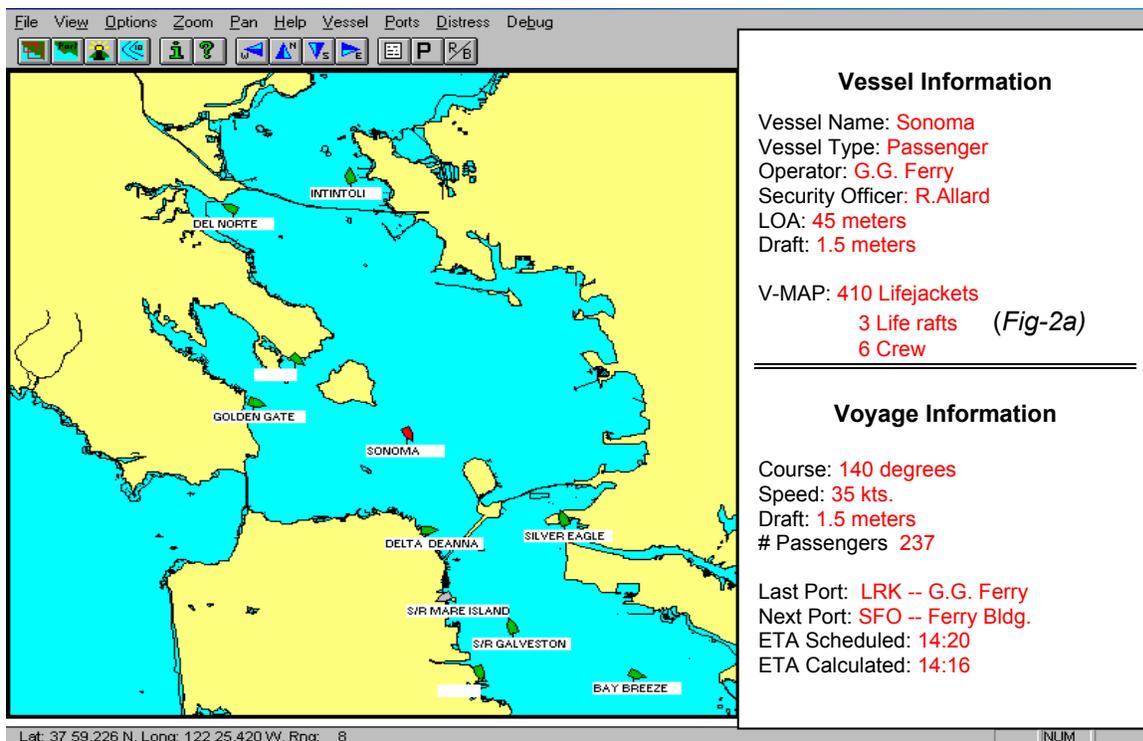
(Fig.1)

Static data such as name, address and phone are entered, maintained and updated by individual port stakeholders such as a ships agent or local port authority using password encryption. By putting the responsibility on the port stakeholder to maintain this data, it ensures that the information is as accurate as possible. This gives the stakeholder a stake in the system ownership and freeing up valuable resources to address the issues of dynamic data relationships. Examples of dynamic data relationships are the confirmation of data between the dynamic data such as vessel movements from Automatic Information System (AIS) and the entry of esoteric data such as tug codes or a ship's, "first line" and "last line". It will also allow the proper resources to address the additional burden of data error checking and electronic delivery of 96 hour advanced notice of arrival to the National Vessel Movement Center (NVMC) and the support of the regional Coast Guard Marine Safety Office. The web engine will also support a user-defined graphical user interface (GUI) for the port stakeholders based on each organization or individuals needs and security level.

NORCAL-RISCS Graphical User Interface (GUI)

As mentioned in the previous paragraph, the key to any system is timely and accurate data. In order for that data to be efficiently used, it must be graphically displayed based on the users' needs. Some users need the data displayed in the form of a spreadsheet with columns and rows of text and codes while others need it translated and layered on an electronic chart showing the scaled geographical relationship of each identity. Which display should be used? The answer is both. The NORCAL-RISCS GUI is designed with that flexibility and growth in mind. For the user that will need situational awareness the GUI will use the S-57 standard for electronic charts (same as AIS) and will display all vessel movement, port and characteristic information attached to a predetermined icon (Fig.2).

(Fig.2)



The NorCal-RISCS will also maintain constant tracking of vessels participating in the San Francisco Vessel of Mutual Aid and Protection system (SF-VMAP). This information is invaluable to the regional incident command in positioning often-limited assets in the event of an emergency (Fig.2a). It is also our goal to include a second layer to the GUI to accommodate the Automatic Secure Vessel Traffic System (ASVTS) to expand the maritime domain awareness for the Coast Guard to a global perspective. This will provide secure data regarding vessels arriving or transiting the region with an update rate of approximately 4-6 hours. Attached to each vessels data field, the ASVTS-GUI will also provide the most recent ANOA information such as ETA/ETD, Security Officer, crew lists and hazardous cargo manifests (Fig.3).

For those organizations that are interested in data mining, the system will provide access in the form of spreadsheets or databases of all the historical, real-time and future data. Most of the data will be the same displayed on the GUI for retrieval via the Internet.



(Fig.3)

NORCAL-RISCS Database System

The NorCal-RISCS system will employ an extensive relational database structure to collect, maintain, organize and deliver information that will accommodate the needs of operational port stakeholders. Prior to a vessel's arrival, the system will maintain all the data for the ANOA for security data mining and planning. When the vessel is within AIS range of the port it will incorporate the local dynamic data such as pilot designator, vessel speed, course, draft and closest point of approach (CPA) at very short interval rates i.e. 2-6 minutes. Related to this

dynamic data, the database system will maintain extensive vessel information such as vessel flag, size, type and local and geographical information such as vessel agent, tugs, arrival port, berth size/depth and terminal services. The database is also designed to maintain personnel and esoteric information such as email addresses for security personnel for “bang list” deployment in the event of security warnings and MARSEC alerts. A partial list of the expected data fields is attached in Appendix A.

NorCal-RISCS Communications

The last module mentioned in the summary is communications. The communications component of the system will provide information to high and medium security level individuals in a pull/push format (Fig.1). The “pull” portion will be accessible via the web where individuals or organizations can access information such as security notices from a bulletin board at their convenience. For more urgent types of notification the system is designed to allow third party personnel, such as the Captain of the Port, to broadcast in a “push” delivery system. This will deliver smaller information packets of data such as changes in MARSEC levels or focused warnings to specific port entities via telephone, digital pager, cell-phone or personal digital assistant (PDA). Any of the data use in these modes of communication that is considered to be Security Sensitive Information (SSI) will be protected through the approved secure password encryption and certificate means. The communication system will be supported from the database system and delivered through the web engine, allowing all the approved individuals and organizations to maintain contact information via the Internet.

NorCal-RISCS Security

All components of the system will operate on the security principal of a four tiered solution with each tier having access to any information on a lower tier (Fig.1). The first tier will only allow access to high security personnel. Agencies such as the Coast Guard, U.S. Customs and Immigration as well as local and federal law enforcement will have access to all areas of the system. The next level of security will be that of medium access, and will encompass individuals and organizations that have a confirmed role in the direct operational movements of vessel such as pilots, tug companies and vessel agents. They will have a reduced level of information such as actual vessel location and characteristics, ETA/ETD, escort procedures and docking instructions. The third level of security will be that of low. The information will be limited to port stakeholders that are not directly responsible for the movement of vessel. This will include support organizations and individuals such as surveyors, ship chandlers, suppliers, labor organizations and other dock personnel. The information they will have access to will be primarily vessel name, ETA to dock and time in port and contact information of port or berth. The last and most accessible level of access will be that of the very low. This portion of the system will be available to the general public and provide information necessary for the support and efficient administration of all regional maritime organizations. Examples of this information may be items such as current port MARSEC level, multi-layer calendar for maritime meetings and events, regional maritime directory and email information, port permit and licensing applications, regional real-time tide and current and weather information and a links page for federal/civilian agencies and labor organizations. A draft matrix of information access and delivery is shown in Appendix B.

NorCAL-RISCS System Ownership and long term operation

The system will be owned by the regional maritime community with the Marine Exchange of the San Francisco Bay Region as the custodian. The funds for the annual operation of the system will be borne by the users of the system in an equitable fashion depending on the level of security and operational impact. Since grant funding is used for the construction and implementation of the NORCAL-RISCS, the code will be written in such a manner that it can be applied to other COTP zones and will be available to any Coast Guard approved organization for that use at no cost.

NORCAL-RISCS Database Fields Appendix A

Vessel Characteristic Data

- Vessel Name
- Vessel Type
- Call Sign
- Lloyds#
- ASVTS#
- LOA
- Width
- Max Draft
- Grosswt
- Netwt
- Deadwt
- Owner/Oper
- COFER
- OSRO
-

Security Data

- MARSEC LVL 1
- MARSEC LVL 2
- MARSEC LVL 3
- MARSEC LVL 4

Vessel Movement Data

- VMFID#
- LFPOC
- LPOC
- NPOC
- ETADATE SCH
- ETATIME SCH
- ETADATE CALC
- ETATIME CALC
- F-Line Date
- F-line Time
- L-Line Date
- L-Line Time
- Current Location LAT
- Current Location LONG
- Actual Draft
- Actual Air Draft
- Displacement
- Pilot Time
- Pilot Date
- Pilot 1
- Pilot 2
- Escort (y/n)
- TugCode1
- TugCode2
- TugCode3
- From
- To
- Agent

Geographic Data

- Port Code
- Wharf/Berth Code
- Long.
- Lat.
- Length
- # Berths
- Water Depth
- Equipment
- Misc Comments
- Terminal Operator
- Berth phone

Organizational Data

- Company Code1
- Company Code2
- Company Name
- Company Address 1
- Company Address 2
- City
- State
- Zipcode
- Main Phone#
- Main Fax#
- Web Address#
- Service Code1
- Service Code2
- Service Code3
- Service Code4
- Service Code5
- RepContact Name
- RepContact Phone
- RepCnct Cell
- RepContact Email
- SecContact Name
- SecContact Code
- SecContact Phone
- SecContact Cell
- SecContact Pager
- SecContact Cell-email
- SecContact email

NORCAL-RISCS Communication Matrix

| OPERATIONAL | Security Level | Outside Manual Input / Update | Relational Database Link | Read only Distribution | VPN Data Distribution | Wireless Pull Distribution | Wireless Push Distribution |
|---------------------------------|----------------|-------------------------------|--------------------------|------------------------|-----------------------|----------------------------|----------------------------|
| ANOA | Med | Y | Y | Y | Y | N | N |
| VESSEL RPTS. | Low | N | Y | Y | N | Y | N |
| MARINE INFO: | | | | | | | |
| Vessels Inport GUI | Low | N | Y | Y | N | Y | N |
| Local Active Transit (AIS/VTIS) | Med | N | Y | Y | N | Y | N |
| Global Active Transit (ASVTIS) | High | N | Y | Y | Y | Y | N |
| VMAP Layer | Med | N | Y | Y | Y | Y | N |
| Vessel Event Notification | Low | N | Y | Y | N | N | Y |
| P.O.R.T.S | V.Low | N | Y | Y | N | Y | N |
| HIST. / STATISTICAL | Low | N | Y | Y | N | N | N |
| SERV. CAMERAS (link) | High | N | Y | Y | Y | Y | N |
| SECURITY INFO EXCH. | | | | | | | |
| Broadcast | Med/High | Y | N | Y | Y | Y | Y |
| Point to Point | Med/High | Y | N | Y | Y | N | Y |
| Incident Command Contact | Med/High | Y | Y | Y | N | Y | N |
| CARGO TRACKING (Link) | High | | | Y | | | |
| ADMINISTRATIVE | | | | | | | |
| | | Outside Manual Input / Update | Relational Database Link | Read only Distribution | VPN Data Distribution | Wireless Pull Distribution | Wireless Push Distribution |
| Port Information | V.Low | Y | Y | Y | N | Y | N |
| Calendar (multi-layer) | V.Low | Y | Y | Y | N | Y | N |
| B.B. (unsecure) | Med | Y | N | Y | N | Y | N |
| Aids to Nav./Const. Notice | V.Low | Y | N | Y | N | Y | N |
| Online Applications/Forms | V.Low | Y | Y | N | N | Y | N |
| Recreation Notices | V.Low | Y | N | Y | N | Y | N |
| Ferry Schedules | V.Low | Y | Y | Y | N | Y | N |
| Phone/Email Directory | Med | Y | Y | Y | N | Y | N |
| Links Page | V.Low | Y | N | Y | N | Y | N |