



ADVANCED LIGHTING AND APPLIED ILLUMINATION SYSTEMS

November 2005

Giovanni P. Tomasi
President, STGI



“We are on the verge of completely changing the lighting industry landscape in a manner similar to what the computer industry experienced with the introduction of networked systems...”

G. Tomasi & C. Wagner

June 2005



- Business Overview
- Remote Source Lighting Technology
- Advanced Lighting Systems



The Skyler Technologies Group

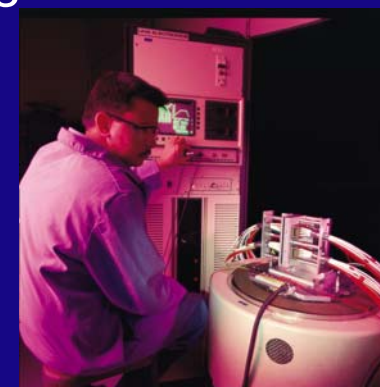
- Incorporated in March 2001
- Senior Executives with experience in fiber optics, electro-optics, applied optics, marketing, and corporate management
- Extensive experience in optical system design, communication and control systems, specialty cable and assembly design, fiber manufacturing and processing, and US Navy programs management



TEAM MEMBERS

Wire Pro, Incorporated

- Business started in 1971
- Over \$ 50 Million in sales
- Headquarters in Salem, New Jersey
- Extensive connector, assembly, and component design & manufacturing capabilities
- Manufacturing facilities in Salem, NJ; Everett, MA; Sarasota, FL; Gardena, CA; Moorpark, CA; Nogales, Mexico; Taipei, Taiwan
- Servicing the aerospace, instrumentation, computer, medical, telecommunication, and networking industries





TEAM MEMBERS

C3I, Incorporated

- **SPECIALISTS IN CRITICAL COMMUNICATIONS, CONTROLS, & INSTRUMENTS**

- **Engineering Disciplines**: Mechanical, Electrical, Computer Software, Information, Human Factors
- **Distributed Data Acquisition Systems**: Battery Management & Monitoring, Mini-Data Acquisition Modules, Hard Real Time Operating Systems
- **Bridge Instruments**: Ship's Speed, Roll & Pitch, Rudder Angle; Wind Speed & Direction; Multi-Function Digital Indicators; Directed Thrust Control Headers
- **Interior Communications**: Intercom Systems; Sound Powered Telephones; Private Telephone Exchanges
- **Design, Development, Prototypes, & Manufacturing**
- **Consultants For & Designers of Shipboard Communication Architectures**





STGI-Business Model

- Capitalize on the high growth, niche segments of the optics industry
- Create synergistic alliances with other companies operating in the same markets
- Assist business partners to develop and evolve critical competencies in the core markets
- Identify, acquire, and/or develop businesses operating in related and complementing fields
- Minimize Overhead costs by flexible allocation of resources between operations



STGI Business

- 95% of Activities to date have focused on Department of Defense business
- Future plans include expansion into commercial market, leveraging lessons learned from military related activities
- Evolution from optics and optical/lighting devices into fully integrated control networks





STGI Core Business

ADVANCED LIGHTING TECHNOLOGIES

FOUR (4) CORE SEGMENTS

1. *Remote Source Lighting*
2. *Advanced Lighting Control Systems*
3. *Security Lighting*
4. *Specialty Lighting*

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STGI Operations

- **RSL Fiber Systems, LLC, Salem, NJ**
 - Remote Source Lighting and Advanced Illumination Systems (50% ownership)
- **C3I, Inc, Hampton, NH**
 - Shipboard/Military Communication, Control, and monitoring systems. Advanced Lighting Controls and Monitoring Systems (Minority ownership)
- **Sud HCM, Rome, Italy**
 - RSL and ALS marketing and field support
- Fiber Optic Cable and Assemblies **Consulting Services**



MANAGEMENT TEAM

- **Giovanni P. Tomasi (STGI)**
 - 20 + years experience in Fiber Optics & Military Applications
 - President, STGI & Vice President, General Manager, RSL Fiber Systems
- **Charles P. Fischer (WPI)**
 - 30 + years in Electro-mechanical design
 - Director of Engineering, WPI & RSL Fiber Systems
- **Charles J. Wagner (C3I)**
 - 30 + years in Navy / DoD Industry
 - US Navy (Ret.), VP Engineering & Co-Owner Henschel
 - Founder & Chief Technical Officer C3I, Inc. & CTO, STGI



RSL FIBER SYSTEMS, LLC

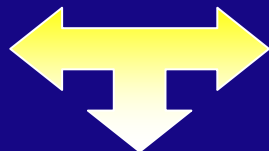
Mission Statement

RSL Fiber Systems, LLC is a joint venture of Wire-Pro, Incorporated and The Skyler Technologies Group, Inc., created to develop Advanced Lighting Technologies for military and commercial applications.



RSL FIBER SYSTEMS, LLC

*Wire Pro, Incorporated
(50% Ownership)*



*The Skyler Technologies Group, Inc.
(50% Ownership)*

RSL FIBER SYSTEMS, LLC

- Acquired the RSL Assets of Winchester (a division of Northrop Grumman) on September 10, 2001
- Assumed Two Critical Programs:
 - Office of Naval Research sponsored RSL ManTech Program
 - Northrop Grumman Ship Systems' LPD 17 Contract
- Equipment transferred to Salem, New Jersey
- Teaming Arrangement with C3I, Inc. of Hampton, NH
- Several advanced illumination programs:
 - ✓ LED Array based systems
 - ✓ High efficiency lighting sources
 - ✓ Fully integrated lighting control systems



STGI Technological Advantage

STGI and its partners have **distilled and amalgamated** over a decade of R&D and implementation efforts in:

- *Illumination fiber optics*
- *Fiber optic cable development*
- *Optical connectors development*
- *Optical systems design*
- *High Intensity Discharge (HID) lamps development*
- *Thermal management*
- *Networked communication and control systems*
- *Intelligent networks*

into a technological concept that is ready to revolutionize the entire illumination management and distribution industry:

Remote Source Lighting & the Advanced Lighting System



REMOTE SOURCE LIGHTING TECHNOLOGY



RSL TECHNOLOGY ADVANTAGES

- *Ability to separate the light source (Illuminator) from the light emission point (Luminaire) by up to 200 meters*
 - Increased safety – **ELIMINATES DANGER OF ELECTRICAL SHOCK**
 - Ease of maintenance (ex: bulb replacement)
- *Ability to change colors instantaneously and remotely via optical filters located in the Illuminator*
- *Small Sized Light Emitters*
 - Reduced installation space requirements
- *Eliminate the IR and UV components of the spectrum*
 - No heat or harmful UV radiation are generated at the light emission points
- *Improved light pattern distribution*
 - Nearly entire light output on area to be illuminated – **NO “WASTED” LIGHT**
 - No Glare outside of area being illuminated – **INCREASED NIGHT TIME SAFETY**



RSL TECHNOLOGY OVERVIEW

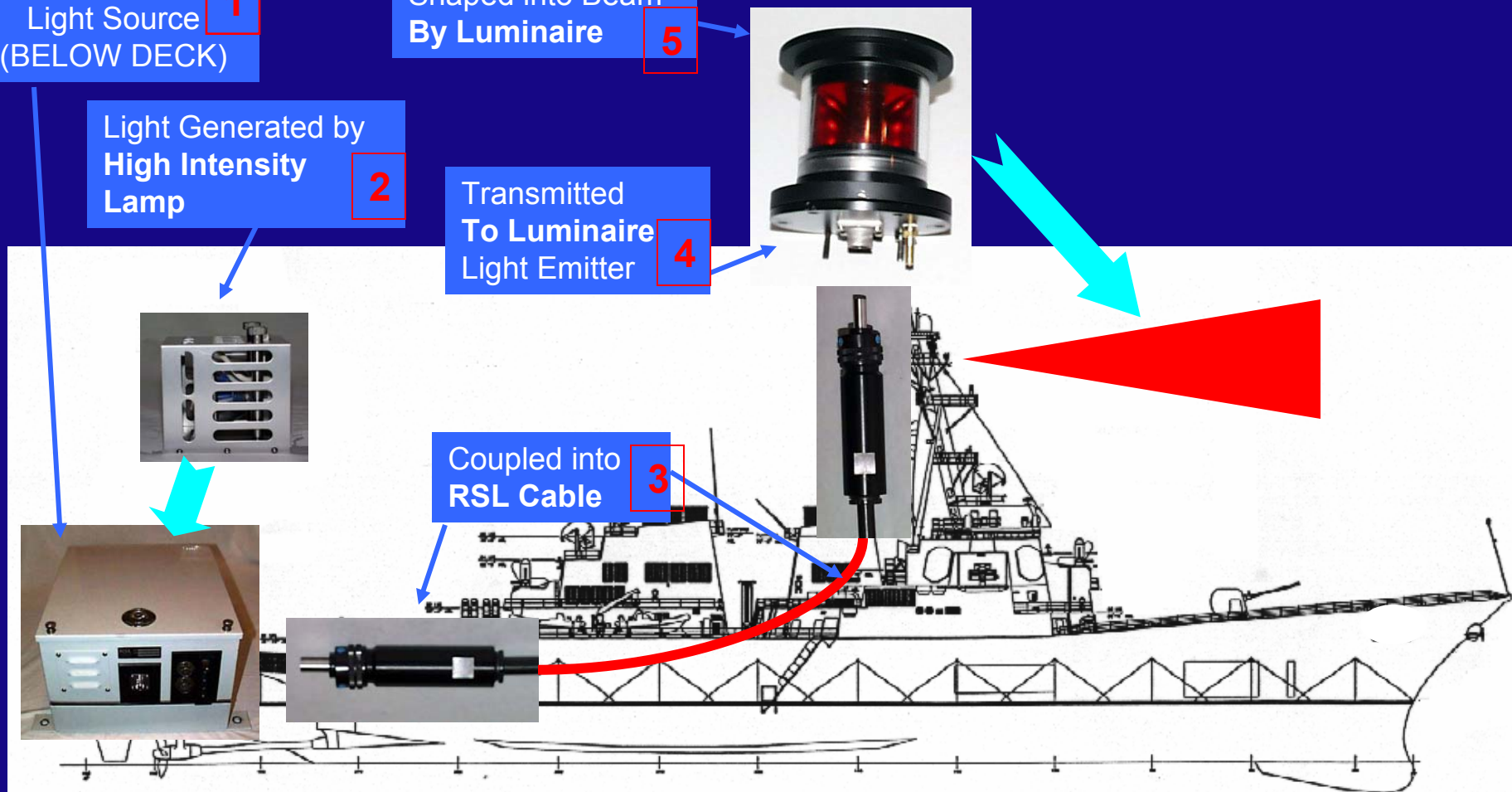
Illuminator
Light Source **1**
(BELOW DECK)

Shaped into Beam
By Luminaire **5**

Light Generated by
High Intensity
Lamp **2**

Transmitted
To Luminaire
Light Emitter **4**

Coupled into
RSL Cable **3**



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RSL SYSTEM: KEY COMPONENTS



Remote Source Lighting Illuminators

- Incorporating an Illuminator Control Module (ICM)



Remote Source Lighting Cable Assemblies

- Connects Illuminators to Luminaires



Remote Source Lighting Luminaires

- Light Emitting Device
- Multiple Functions (Navigation, WLS, VLA, Gen. Lighting...)



LED Based Devices

- Visual Landing Aids, Aircraft Warning Light, Interior Lighting...





RSLFS COMPETITIVE EDGE

TECHNICAL ADVANTAGES

- **Compliance with stringent Military & Navigation Requirements**
 - Shock to MIL-S-901D (Grade A, Med Weight) with no shock mounts
 - Vibration to MIL-STD-167-1 with no shock mounts
 - EMI to MIL-STD-461
 - UL-1104 / COLREGS 72 Regulations
 - Form, Fit, Function...
- **Maintainability**
 - Ease of Service / Repair
 - Modular Design, Easily Upgradeable
 - Parts Availability > Commonality of Components
- **Performance**
 - High light output
 - Long distances between light source and emitter
 - Long lifecycle, Rugged construction



SHIPBOARD ADVANCED LIGHTING CONTROL SYSTEM

A fully integrated lighting control and monitoring system capable to provide multiple control locations for conventional, LED, fiber optic based, and any other lighting and illumination device used aboard a vessel by utilizing the ship's existing communications network...



CONTROL SYSTEM HISTORY

Winchester



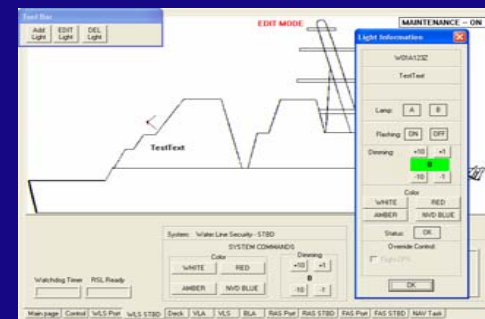
- 1997- 1998: Legacy System – “Stove Pipe”, hard wired approach. Individual controls for individual light groups. No “universal” lighting control system
- 1998: US DDG Class Installation – Controls for some lighting groups using ship’s network. Still no “universal” lighting system



RSL Fiber Systems, LLC / C3I, Inc.



- 2003: US Shipbuilder’s IRAD (Independent Research and Development) – Provide controls for RSL test system. RSLFS / C3I expand scope of task. SALS concept created w/ guidance of Shipbuilder / Navy





CONTROL SYSTEM HISTORY

RSL Fiber Systems, LLC / C3I, Inc

- 2004-2005: Shipboard Advanced Lighting System – Created to meet demands of 21st century US Navy → Reduced Manpower, Multi-Mission capabilities, Littoral vs. Blue Water, NVIS aided operations...
- 2005: Selected by US Navy agency for further development and implementation on new platforms...



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CONTROL SYSTEM - BENEFITS

- Control **ALL lighting devices**, not only those manufactured by RSLFS
- Provide immediate **status information** on each lighting device or lighting group
- Provide the ability to **remotely control, from multiple locations**, all lighting and illumination devices including conventional incandescent, fluorescent, LED, and fiber optic based, using the ship's existing network
- Provide the ability to **expand or alter the system configuration** with minimal hardware changes
- Allow for the **immediate transfer of control** of the pertinent lighting devices and lighting groups to the required location (example: Flight Deck during night landing operations)



CONTROL SYSTEM ADVANTAGES

- Universal System Architecture – Compatible and fully integratable into any ship wide network
- Easily Manageable – Centralized monitoring, control, and preventive maintenance capabilities of ALL lighting devices.
- Infinitely Upgradeable – Minimal (or no) installation of new hardware and new cables (using the ship's existing network)
- Hierarchical System – No possibility of the “wrong” lights being turned on during mission critical operations
- Greatly Improved Safety – Immediate transfer of control of the pertinent lighting devices and lighting groups to the required location (example: Flight Deck during night landing operations)
- Lower Manpower Requirements – Easily controlled and maintained by fewer personnel.



CONTROL SYSTEM: KEY COMPONENTS



Touch-Screen Control Panel

- Can Also Use Ship's Existing Control Panels



Digital Interface Module Ethernet to RS485 (DIMER)

- Connects Lighting Devices to Ship's Network

Illuminator Control Module (ICM)

- Fully Addressable, allows for remote or local control



ALS Processor Control Module (PCM)

- Contains ALS Software
- Allows for the use of the ship's existing control panels

Lighting Technology Interface (ICM)

- Fully Addressable
- Allows for control of individual light or group of lights



SHIPBOARD LIGHTING SYSTEM COMPONENTS

FLIGHT DECK CONTROL PANEL



MID-SHIP CONTROL PANEL



BRIDGE CONTROL PANEL



AIRCRAFT WARNING LIGHT



NAVIGATION LIGHTS



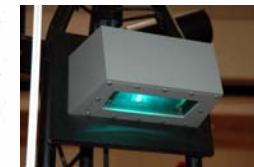
FLOOD LIGHTS



VLA



WLS



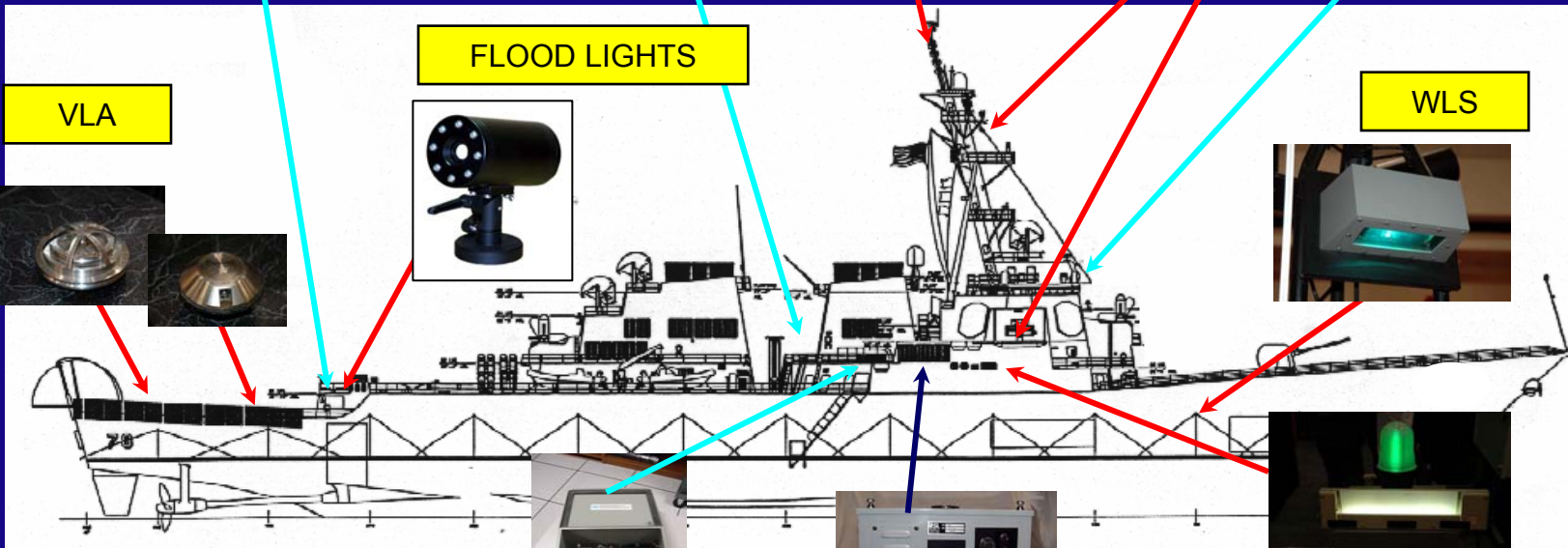
DIMERS



ILLUMINATORS



INTERIOR LIGHTS



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CONTROL HIERARCHY

EXAMPLE: FLIGHT OPERATIONS

FLIGHT DECK CONTROL PANEL



MID-SHIP CONTROL PANEL



BRIDGE CONTROL PANEL

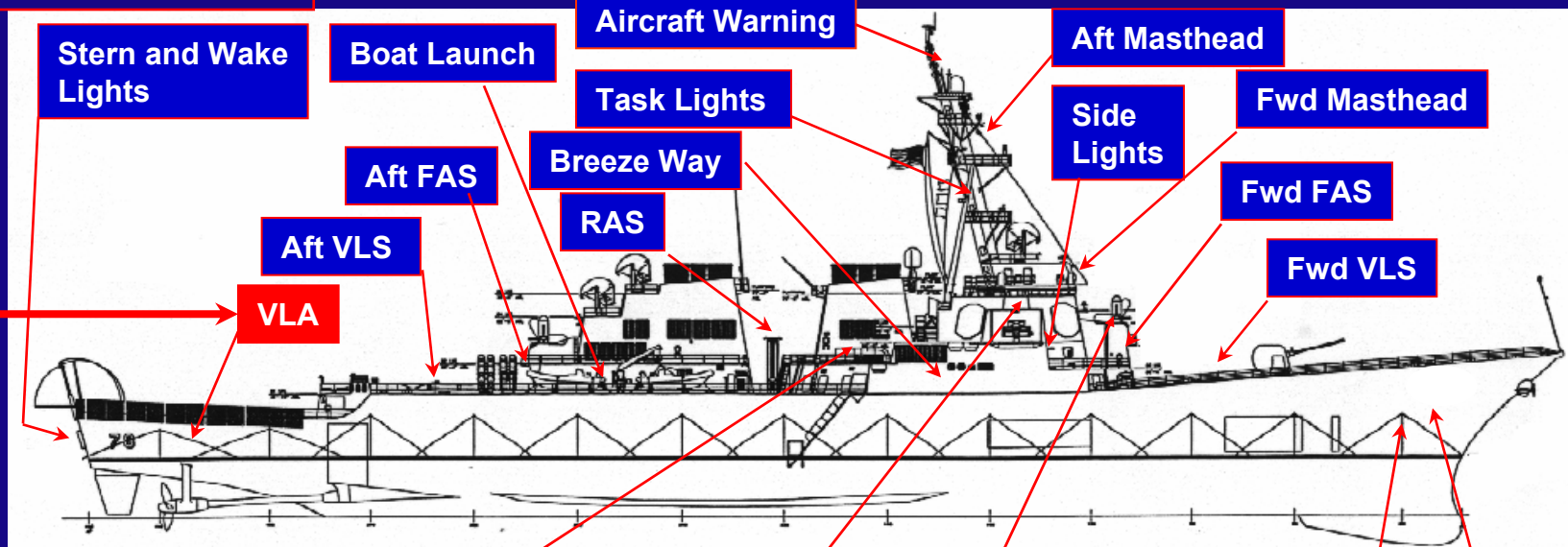


Limited

Limited

master

VLA ONLY



SRBOC

Bridgewing

CIWS

Waterline Security

Bow Numeral



COMMENCE FLIGHT OPERATIONS...

FLIGHT DECK CONTROL PANEL



master

MID-SHIP CONTROL PANEL



Limited

BRIDGE CONTROL PANEL



Limited

Relinquish control of VLA / critical lights

Critical Lights: Any Light that may affect the pilot's NVIS aided landing operation



DURING FLIGHT OPERATIONS...

FLIGHT DECK CONTROL PANEL



master

MID-SHIP CONTROL PANEL

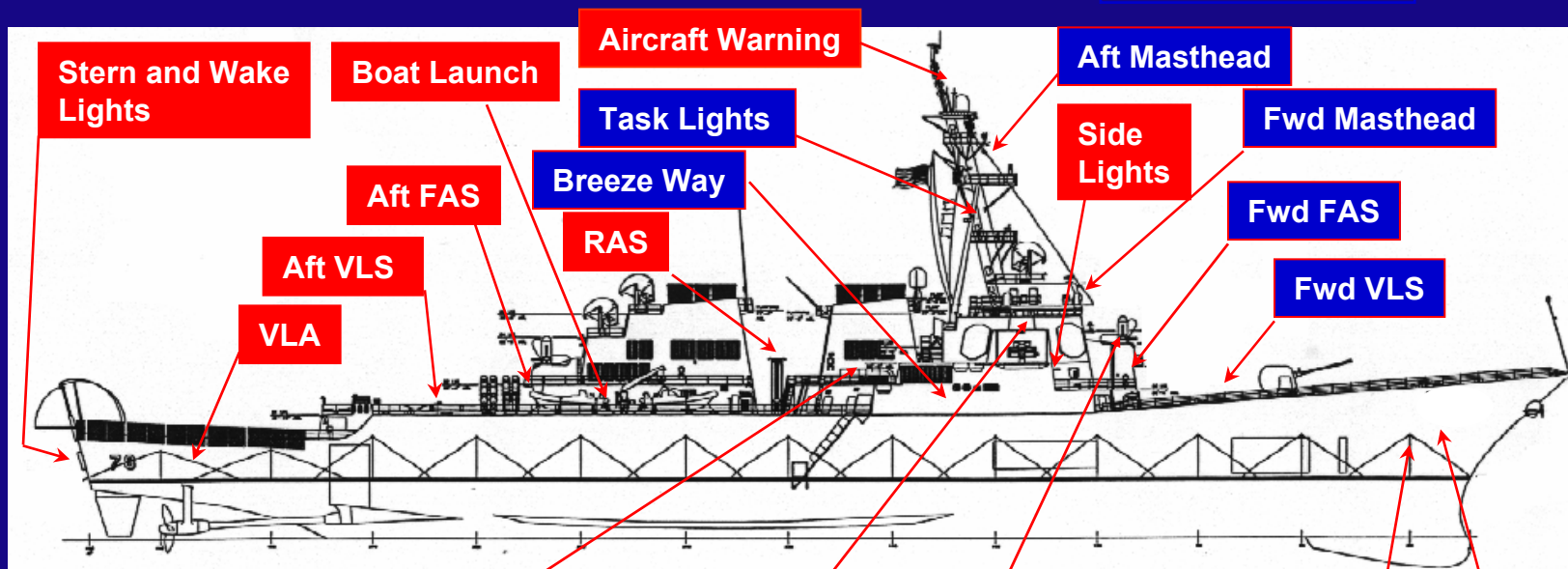


Limited

BRIDGE CONTROL PANEL



Limited





COMPLETE FLIGHT OPERATIONS...

FLIGHT DECK CONTROL PANEL



Limited
VLA Only

MID-SHIP CONTROL PANEL



Limited

BRIDGE CONTROL PANEL



master



Relinquish control BACK TO Bridge



RSL / ALS APPLICATIONS



Manufacturing Facilities



Theaters and commercial buildings



Chemical processing plants and oil refineries





RSL / ALS APPLICATIONS

Offshore Platforms



Street Lighting



Commercial vessels





SUMMARY

- *The RSL and ALS technology has been successfully implemented in highly demanding military applications*
- *The lessons learned in these most demanding applications are being applied to a number of commercial sectors to resolve illumination problems encountered with conventional and even with LED lighting*
- *Ongoing development efforts undertaken by STGI and its partners will further expand the use of RSL and ALS into the industry*
- *The STGI Team is actively looking for business partners to assist with the expansion of the RSL and ALS technologies in selected market segments...*



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