

Ocean Class SMR Input Navigation and Communications

Robert Knox - SIO

1 Physical Oceanography

Ocean circulation - But I'm going to use this form mainly to insert some overall observations or workshop discussion items into the mill, based on my reading of inputs thus far (7/1/02)

Navigation

GPS - Pcode or DGPS. □ Main issue is easy display/distribution of data. □ But antenna has to be sited OK (see #9).

Communications Internal

Mostly not initial design drivers, perhaps with the exception of antenna placements. □ But clearly we want good intra-ship data distribution and networking, good intra-ship communications in various modes, and some hands-on/off comms. options in some locations, especially on deck. □ Ability to contact an individual is important, particularly with larger scientific parties. □ Pager/beeper/local cell phone system? □ See R. Pittenger comment. □ One often wants to call/find Dr. X, but not by PA system or by phoning room and waking roommate Dr. Y. □ Much of this topic involves wiring considerations. □ Two points - good cable trays (ease of access) and routes, and minimize the hassles of transit blocks. □ Perhaps put some science transit blocks where needed, with connectors on both sides to cut down on stringing long cables through them?

Communications External

We should go for solid, affordable 7/24 internet connectivity. □ Apart from antenna issues this ought not to be a major ship design driver. □ Ship(s) should have the latest and greatest in this realm. □ One potentially useful approach is on cover of Sea Technology for May. □ Satellite image acquisition - onboard/direct? □ Via internet?

Ed Carpenter - SFSU

Biology

phytoplankton ecology, nutrient cycling

Navigation

GPS

Communications Internal

Should be able to easily acquire SEAWIFS and other satellite images.

Communications External

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Anthony Michaels - USC

Biology

Role of biological community structure in the cycling of biogenic elements in the ocean.

Navigation

Current capabilities OK

Communications Internal

higher bandwidth internet, email. Need to acquire satellite imagery online or even onboard.

Communications External

Higher bandwidth internet. email

Paul Hargraves - URI

Biology

phytoplankton

Navigation

GPS

Communications Internal

varied

Communications External

varied

Grace Klein-MacPhee - URI

Biology

Fishery Science

Navigation

Communications Internal

telephone,radio, intercom

Communications External

e-mail

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Edward Durbin - URI

Biology

Zooplankton

Navigation

Communications Internal

Communications External

Ability to receive seawifs images

Joan Bernhard - South Carolina

Biology

Benthic ecology and physiology of meiofauna and microorganisms. This necessitates collection and maintenance of live material (i.e., temperature sensitive).

Navigation

NOOTOR

Communications Internal

NOOTOR

Communications External

Each ship should be equipped with email that does not have to go through the captain; it has been known to happen that some captains are not particularly accommodating; the science party should be able to reliably contact their shore-based personnel.

Bob Campbell - URI

Biology

Zooplankton Ecology

Navigation

GPS, Dynamic positioning

Communications Internal

High quality voice in all science and working areas. Closed circuit monitoring of all work areas. Intranet computer access in all science and berthing areas. Monitors for ship navigation and environmental conditions in most science areas.

Communications External

As in SMR for Intermediate General-purpose Ship. Also, 24 hr access to email/internet in science and berthing areas.

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Jeremy Collie - URI

Biology

Fish Population Dynamics and Benthic Ecology

Navigation

Communications Internal

Communications External

Richard Barber - UNC/Duke

Biology

primary productivity regulation

Navigation

conventional GPS with state of the art computational background (lagrangian navigational studies overload existing UNOLS capability)

Communications Internal

satellite communication, especially for wide bandwidth communication of satellite images

Communications External

see #18

William Cochlan - SFSU

Biology

Phytoplankton and bacterial productivity, nitrogenous nutrition

Navigation

satellite/GPS

Communications Internal

close-circuit TV system for monitoring of working spaces on weather decks and labs; also accessible from cabins

Communications External

e-mail capable of handling large attachments, internet capability, SeaWIFS capability

**Ocean Class SMR Input
Navigation and Communications**

Sharon Smith - RSMAS

Biology

zooplankton ecology

Navigation

best available

Communications Internal

simple, reliable not subject to constant tech tinkering

Communications External

best available

Elizabeth Venrick - SIO

Biology; Chemical

Physics, chemistry and biology of the California Current with emphasis on fishery oceanography, planktonic ecosystem structure and function and climate-ocean interactions

Navigation

Communications Internal

live link with shore station

Communications External

Ocean Class SMR Input Navigation and Communications

James Meehan - NMFS

Biology/Other

Living Marine Resources life histories, population structures, and stock assessments. Ecology and dynamics of Large Marine Ecosystems. Identification and description of Essential Fish Habitats and endangered species Critical Habitats

Navigation

X-band radar ,S-band radar
Gyro system, Magnetic compass
Navigational GPS reciever
Track plotter/electronic chart system
Integrated bridge system
Recording echo sounder
Dual axis doppler speed log
Digital master clock

Communications Internal

Intercom system
General anouncing system
Sound powered phone system
Telephone system
Two Fax machines

Communications External

GMDSS, Weatherfax, PCs as required by communications suite
Marine VHF radio, Four Handheld Marine VHF radios
Aircraft radio, INMARSAT requirements in addition to GMDSS
Standard type B system, Standard type C system
Standard type mini-M system, Cellular phones, one fixed with RJ-11 interface, One satellite

Rana Fine - RSMAS

Chem. Oc.

Tracer Oceanography

Navigation

for hydrography

Communications Internal

good internet

Communications External

good internet

Ocean Class SMR Input Navigation and Communications

Frank Sansone - Hawaii

Chemical Oceanography

Hydrothermal plume biogeochemistry; trace gas biogeochemistry

Navigation

Standard GPS is sufficient

Communications Internal

Easy access to shipboard network (including file sharing and access to CTD data) by PC and Mac notebooks brought aboard by scientists -- this includes having two ethernet jacks in each stateroom, and numerous jacks in each lab . Easy network access to laser and color printers.

Communications External

Iridium (or equivalent) phone

Mark Altabet - Massachusetts

Chemical Oceanography

marine biogeochemistry; oceanic nitrogen cycling, N and C isotope biogeochemistry

Navigation

normal GPS, etc. plus ability to lagrangian navigate about deployed, free-floating gear a la recent SOFeX experiment

Communications Internal

LAN supporting PC, Mac's , and UNIX machines in labs and state rooms. □Underway , weather, □navigation, and other data available on a web page.

Communications External

for remote from land locations - robust high speed satellite communication; for nearshore-cellular phone link capable of sustained data transfer and linkage to internet.

Stephen Miller - SIO

G & G

mid-ocean ridges
seafloor mapping
databases and archives

Navigation

GPS pcode and differential

Communications Internal

intranet, intercom

Communications External

Roadnet <<http://roadnet.ucsd.edu/>> & Internet

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James Cochran - LDEO

G & G

lithospheric/crustal creation and evolution, rifting processes - both at mid-ocean ridges and continental rifts

Navigation

p-code GPS, dynamic positioning

Communications Internal

intranet connections in all labs and cabins. Adequate access to net throughout lab space for instruments and scientists computers. access to data stream for real time processing and analysis

Communications External

internet access

Robert Pockalny - URI

G & G

Seafloor Mapping and Underway Geophysics

Navigation

DGPS and dynamic positioning

Communications Internal

at a minimum inmarsat B for e-mail would be nice to have continuous internet link (for educational purposes)

Communications External

Daniel Fornari - WHOI

G & G

Mid-Ocean Ridge, oceanic transform, and seamount research, including hydrothermal vents, basalt geochemistry, submarine volcanology, seafloor mapping

Navigation

pcode GPS, DP, LBL

Communications Internal

better Inmarsat- higher speed, lower cost...

Communications External

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John Collins - WHOI

G & G

Seismology

Navigation

GPS, DGPS, whatever the Europeans put up

Communications Internal

Gigabit Ethernet; Wireless Ethernet (802.11b or its successor).

Communications External

High-Bandwidth Connection to shore providing 2 Megabits/second bandwidth or better, e.g. VSAT (C-Band) System; VHF system for tracking instrumentation.

Peter Lonsdale - SIO

G & G

structure and geomorphology of oceanic crust, defined by geophysical surveys

Navigation

GPS

Communications Internal

uninterruptable lab-to-bridge

Communications External

minimal

John Hildebrand - SIO

G & G

Marine Geodesy - study of crustal movements using acoustics and GPS

Navigation

Geodetic quality GPS and precision dynamic positioning

Communications Internal

Communications External

Design high speed satellite internet link (such as recently demonstrated on Revelle).

Ocean Class SMR Input Navigation and Communications

Robert Ballard - URI

G & G; Other

Deepwater Archaeology

Navigation

DGPS

Communications Internal

control van to bridge

Communications External

two-way broad band satellite communications

John Orcutt - Scripps Institution of Oceanography

G & G; other

Marine seismology

Navigation

DGPS - now possible with continuous communications to shore to maintain 1m accuracy.

Communications Internal

Continuous C-Band or Ku Band connectivity at least at 64kbps. For a ship of this class working relatively close to shore, Ku-Band with a small radome is probably most practical. Note above that this can provide highly accurate GPS corrections as well.

Communications External

VoIP for voice telephony delivers to ship's pbx system. In addition, wireless connectivity throughout the ship using either 802.11b or Bluetooth.

Sean Wiggins - SIO

G & G; other

Marine Geophysics & Oceanographic Instrumentation

Navigation

P-code

Communications Internal

labs and decks to bridge vocal, LAN for computers

Communications External

broadband email/fax/voice, high speed satellite - internet

Ocean Class SMR Input Navigation and Communications

John Bash - URI

Other

Research Vessel Management

Navigation

Dynamic positioning, GPS

Communications Internal

Staterooms and labs linked with fiber

Communications External

Continuous internet access at sea

Joe Coburn - WHOI

Other

Research Vessel Management

Navigation

10 cm precision, as afforded by for example the POS-MV system.

Communications Internal

Science announcing system (in addition to general announcing sys. and alarms) computer network, telephone to all work areas and staterooms, CCTV coverage of decks,

Communications External

next generation broadband

Marc Willis - OSU

Other

N/A

Navigation

Communications Internal

Multiple, independent communications means (announcing system, intercom, telephones to staterooms, labs, control stations), wired and wireless networking through all spaces, wireless to open deck areas. Extensive CCTV system covering all deck areas, deck machinery spaces (internal and external winches), and close aboard.

Communications External

Broadband wireless systems, satellite comms, next-generation systems

Ocean Class SMR Input Navigation and Communications

Steve Poulos - Hawaii

Other

Instrumentation

Navigation

Std GPS systems, GMTTime, Inertial systems (attitude info), broadcast to all labs

Communications Internal

Std plus 'closed comms' for all labs; (lab to lab) or (lab to winch) or (lab to bridge)

Communications External

Richard Pittenger - WHOI

Other

NA

Navigation

GPS, POSMV, DPS

Communications Internal

Beeper/cell phone system internally, mission announcing, normal 1MC emergency

Communications External

INMARSAT; think about wide band/satellite required USCG comms, 2 radars X, L band

Ocean Class SMR Input Navigation and Communications

Paul Ljunggren - LDEO

Other

Marine Operations

Navigation

GPS- Differential, P Code

Communications Internal

Good quality internal comms- Phones in each work space or stateroom. Connections to network available all staterooms. Data transmission monitoring and recording in science spaces.
Closed circuit video monitoring and recording system of work areas.

Monitors for ship controls, environmental readouts, science, etc.

Communications External

GMDSS outfit
INmarsat B or F77
Cell phone
Fax capability

Thomas Rossby - URI

Phys. Oc.

Ocean circulation with emphasis on the Gulf Stream and North Atlantic Current system. Perhaps work farther north in future.

Navigation

GPS and optical gyroscopes (Octans)

Communications Internal

Communications External

Ocean Class SMR Input Navigation and Communications

Terrence Joyce - WHOI

Physical Oceanography

Ocean general circulation, mesoscale variability

Navigation

P-code capable

Communications Internal

high speed ethernet in labs and staterooms

Communications External

inmarsat, global cell phone [eg irridium]

James Ledwell - WHOI

Physical Oceanography

Tracer release experiments

Navigation

normal GPS

Communications Internal

Computer network all labs; Good deck to bridge system; Video monitors of winch, deck in labs

Communications External

email; internet

Dave Hebert - URI

Physical Oceanography

Mixing processes

Navigation

Communications Internal

Room to Room communcion, Good clear (hands-free) communications to/from the bridge from all parts of the ship

Communications External

Ocean Class SMR Input Navigation and Communications

Bill Johns - RSMAS

Physical Oceanography

Large-scale Ocean Circulation, Western Boundary Currents and Mesoscale Processes

Navigation

GPS pcode, ASHTEK or comparable 3-D nav system.

Communications Internal

Communications External

Tetsu Hara - URI

Physical Oceanography

Air-sea interaction

Navigation

Communications Internal

Communications External

Continuous internet access at sea (desirable)

David Farmer - URI

Physical Oceanography

Upper Ocean Physics, Internal Waves, Coastal Processes

Navigation

Standard capability.

Communications Internal

Good voice and video communication deck-to-bridge and lab-to-bridge.

Communications External

Efficient email access essential. Must be accessible from lab.

Ocean Class SMR Input Navigation and Communications

Mark Wimbush - URI

Physical Oceanography

Western Boundary Currents, esp. Kuroshio

Navigation

normal (GPS)

Communications Internal

normal

Communications External

internet access at sea would be an asset

Jack Barth - OSU

Physical Oceanography

coastal physical oceanography especially fronts and jets

Navigation

GPS; differential capable and/or P-code

Communications Internal

high-speed shipboard computing network with access to ship's echosounder and GPS navigation. Good voice communications with bridge and various work stations (e.g., aft deck, hydro bay)

Communications External

Good cell phone communication for coastal work in populated areas. This is a low-cost, simple way to communicate but unfortunately the present large research vessels do not have this capability. Also need a reliable satellite connection. Ideally a 24/7 internet capable connection would be best.

Mark Prater - URI

Physical Oceanography

mesoscale dynamics, Lagrangian (RAFOS) floats

Navigation

Communications Internal

voice: phones and radio/walkie-talkies, computer: ethernet to all labs (3 times as many ports as scientists), intra-ship email

Communications External

phone, fax, e-mail, electronic data transfer sufficient for (for example) satellite images

**Ocean Class SMR Input
Navigation and Communications**

John Toole - WHOI

Physical Oceanography

observational physical oceanography

Navigation

GPS, acoustic tracking/ranging

Communications Internal

ethernet

Communications External

modest data rate (email), minimal cost.

Brian Guest - WHOI

Physical Oceanography

Neutrally Buoyant floats and subsurface moorings

Navigation

GPS and backup

Communications Internal

All cabins, labs and deck areas should have communications.

Communications External

email, fax and sat phone.

Ocean Class SMR Input Navigation and Communications

Charles Flagg - BNL

Physical Oceanography

Continental Shelf Processes, Shelf-ocean exchange, fronts

Navigation

P-Code and 3-D GPS receivers are minimally required with sufficient backups or duplicate systems.

Communications Internal

There should be an easy to use network on board with sufficient storage space to so support a wide variety of systems. The Seabeam and ADCPs will generate the greatest amount of data and once those systems are adequately supported, other requirements should be easily accommodated.

Voice communication throughout the ship should be readily available through squawk boxes and hand-held radios.

Communications External

Full-time high-speed data communication with shore is vital if we're to take advantage of the remote sensing that is now available or the realtime modelling that is coming online.

Igor Belkin - URI

Physical Oceanography

physical oceanography of fronts

Navigation

0

Communications Internal

0

Communications External

0

Ocean Class SMR Input Navigation and Communications

Craig Lee - UW

Physical Oceanography

upper ocean and mesoscale dynamics

Navigation

- P-code and differential GPS
- Ashtech 3DU or better GPS heading unit

Communications Internal

- Network access in all rooms
- Hand-free VHF or similar for communications between lab, bridge and deck
- If possible, consider designs that minimize physical distance between main lab and bridge to facilitate communications.
- Design for clear field of view between bridge and working deck.

Communications External

- Iridium or Inmarsat.
 - Any chance of fast, full-time internet network connection?
-

Ruth Curry - WHOI

Physical Oceanography

Water mass properties and ocean circulation in the context of global and regional climate

Navigation

GPS

Communications Internal

Deck - bridge - lab radio communication. Shipboard ethernet.□□

Communications External

email / ability to download satellite altimetry

Ocean Class SMR Input Navigation and Communications

Al Plueddemann - WHOI

Physical Oceanography

air-sea interaction and upper ocean dynamics

Navigation

GPS

Communications Internal

phone/intercomm plus hand-held radios

Communications External

email, fax, sat. telephone

Randy Watts - URI

Physical Oceanography

dynamics of large scale current systems

Navigation

GPS with p-code; Ashtek-type directional GPS

Communications Internal

LAN network

Communications External

broader bandwidth than today seems advisable for the future; email and fax and voice phone;
