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Profile ID : 54
PS : Carol Robinson
Agreement Submission Date :

Cruise Planning Supply Agreement Form (Agreement or AGR)

Ship :	RRS Discovery
Sea Systems Cruise Manager :	Darren Young
Cruise sail date :	15-04-2009
Cruise working area :	Cape Verde
Reference :	D330A
Date of meeting :	23-10-2007

Review meeting NMF-SS operations participants.
Darren Young, Jon Short Alan Sherring, Dougal Mountifield
Review meeting Scientific participants.
Carol Robinson, Ricardo Torres, Malcolm Woodwood.
NMF-SS marine distribution (participants plus).
Master

AGR - PART 1 : Cruise itinerary and support

Scientific activities

AGR AGR - PART 1 : Cruise itinerary and support

Outline of scientific activities

SOLAS aims to progress the understanding of environmentally significant interactions between the atmosphere and ocean. Coastal upwellings influence atmospheric chemistry and oceanic biogeochemistry through emissions of upwelled gases and supply of nutrients for plankton growth.

This cruise plans to study the interacting physical, photochemical, ecological and biogeochemical processes which influence trace gas production within an unequivocal lagrangian framework.

An upwelled filament or jet will be labelled with SF₆ allowing comparative sampling within and outside the seeded waters, with a 7 day (approx) temporal study within a filament as it moves offshore. During this cruise trace gas source strength and transfer velocity will be measured for the first time.

Objective 1:

To determine the role of upwelling on the supply, loss and air-sea exchange of trace and biogenic gases.

Objective 2:

To determine the photochemical and biological fate of upwelled and recently produced DOM and its role in air sea exchange of climatically important trace gases.

Objective 3:

To determine the impact of nutrient rich water on the spatial and temporal variability of the plankton community structure and activity and resultant influence on the biogenic gas flux.

A general breakdown of activities (not including transit) is outlined below:

MVP/FRRF/AFC/ADCP - 4 days

Drifter/SF₆ - 2 days

Sample in/out SF₆ patch - 7 days

CTD / MVP across filament - 2 days

Relocate upwelling - 2 days

Drifter and SF₆ release - 2 days

Sample in/out SF₆ patch - 7 days

CTD / MVP across filament - 2 days

MVP/FRRF/AFC/ADCP - 3 days

TABLE : STAFF MOBILISATION - for PROFILE 54

Updated on 08-04-2008 by sallyh

Technical support :		Jonathan Short Dougal Mountifield Dave Teare Allan Davies Chris Barnard	
Mobilisation officers :		Jon Short, Darren Young	
Mobilise Demobilise	Date	Personnel	Personnel Numbers
Mobilisation	09-05-2008	Jonathan Short Dougal Mountifield Dave Teare Allan Davies Chris Barnard Darren Young	6
Demobilisation	24-07-2008	Jonathan Short Dougal Mountifield Dave Teare Allan Davies Chris Barnard Darren Young	6

TABLE : CRUISE ITINERARY - for PROFILE 54

D338 RRS Discovery 42Days Cape Verde Profile (54) View SME Robinson UEA	Mob Date	Sail Date	Mid Port Date	Dock Date	DeMob Date
	03-04-2009	15-04-2009		27-05-2009	27-05-2009
	MobPort	Sail Port	Mid Port	Dock Port	DeMob Port
	UK	Ten		Ten	Ten

NMF-SS technical support for; Instrumentation, Mechanical, Computing, Mooring

@jos
 @dm1
 @dte
 @azd
 @cvb

NMF-SS marine technical support**AGR AGR - PART 1 : Cruise itinerary and support****Number of deck ratings**

4 plus PO, CPO, CPOS

Ratings at 5:1 & 2:1 training level

4 @ 2.5:1

Detail NMF-SS winch driving requirement

24 hr requirement for cruise duration although CTD operations will be sporadic.

TABLE : CRUISE RISK ASSESSMENTS - for PROFILE 54Please download, complete and upload [your](#) Profile Risk Assessments - [here].

Risk Assessment Name	User Details	Uploaded File
CTD Operations Rev2	UKORS OPS	File not loaded
Deck Operations Rev1	RSU	File not loaded
Gas Generators Rev1	UKORS OPS	File not loaded
Millipore Rev2	UKORS OPS	File not loaded
Millipore Rev2-cossh	UKORS OPS	File not loaded
Moorings Operation Rev2	UKORS OPS	File not loaded
MVP Rev0	UKORS OPS	File not loaded
PES - Echo Sounder Rev1	UKORS OPS	File not loaded
Quay wall loadingRev0	RSU	File not loaded
Winches and wires Rev0	RSU	File not loaded
Working aloftRev0	RSU	File not loaded
XBT Rev0	UKORS OPS	File not loaded
General Lab Ops	Robinson	General_Lab_Ops_complete.doc
RN Operations	Robinson	RN_Operations_complete.doc
Scientific Manual Handling	Robinson	Scientific_Manual_Handling_complete.doc

Vessel operation**AGR AGR - PART 1 : Cruise itinerary and support****Please enter comments**

On board purchases:

The method of payment for payment for goods/services purchased on board the vessels has recently been updated. NMF ships are now fitted with 'cashless tills' for use in the bars and bond whereby anyone wishing to make a purchase will use a dedicated 'swipe card'(supplied once you join the vessel) with the data stored in the tills for downloading and collating.

The contact regarding this system is Sue Parker, (sho1@noc.soton.ac.uk , ext. 26146) and all participants can contact her if they have any questions regarding this system.

Cruise participants are now required to credit there ships swipe cards before they join the vessel.

TABLE : FREIGHT REQUIREMENTS - for PROFILE 54

Transport type	Transport description	Dispatch location	Dispatch date	Destination	Arrival date
No freight information has been input.					

AGR - PART 2 : Mobilisation**Mobilisation matters arising****AGR AGR - PART 2 : Mobilisation****Please enter comments**

There is a substantial amount of equipment to load and commission during this mobilisation. If PML source additional lab containers (up to 2), the decks will be full. A deck layout is needed from NMFs asap to determine the best deck layout and location of equipment.

Radio isotopes will be delivered to the ship along with other hazardous air freight, full lists to be supplied by the end of Feb 06.

Mob will begin on the 9th May, scientific staff will join the ship on the morning of the 12th.

AGR - PART 3 : Demobilisation

Demobilisation matters arising

AGR AGR - PART 3 : Demobilisation

Please enter comments

The Demob for D330A will be at the end of D330B. There is no port call between D330 A and B. These two cruises are really one complete cruise and are only separated on the cruise program for funding arrangements.

Demob is planned to take 1 day (24th June).

Approx' 3 containers to sea freight back to the UK, with hazardous air freight to be managed.

RN samples will be freighted back to the UK.

Dry shippers and dry ice air freight will be required.

All freight leaving the ship must be channelled through the TLO, mobilisation officer and Master. All freight documentation must be checked and recorded by the mobilisation officer before being dispatched from the ship. The mobilisation officer needs to inform the UK shipping agents of each individual piece of freight entering the UK so entry documentation can be prepared, this route is via the NMF operations group.

Cruise Number :	D338
Institution :	UEA
PI Last Name :	Robinson
Sea Systems Cruise Manager :	Darren Young
Vessel :	RRS Discovery
Sail date :	15-04-2009
Dock date :	27-05-2009
Cruise working area :	Cape Verde

QUE - PART 1 : Equipment Pool SECTION A : Portable Equipment

1. Chemistry		AGR QUE - PART 1 : Equipment Pool SECTION A : Portable Equipment
1.1 Radionuclide laboratory container.		Yes
1.1 Clean chemistry laboratory container.		Yes
1.2 Ship fitted laboratory fume hood.		Yes
1.2 Ship fitted laboratory laminar flow hoods.		Yes
1.3 Laboratory hydrogen gas generators.		Yes
1.3 Laboratory pure air gas generators.		Yes
1.3 Laboratory nitrogen gas generators.		Yes
1.4 Laboratory liquid nitrogen generator.		Yes
1.5 Laboratory pure water system (Millipore).		Yes
1.6 Underway water sampling system (Trace Metal Spec).		Yes
1.7 Liquid scintillation counter.		Yes

2. Seismics/Echo Sounders/Coring		AGR QUE - PART 1 : Equipment Pool SECTION A : Portable Equipment
2.4 PES - Precision echo sounder 10kHz (10/12 kHz fish and hull mounted system).		Yes
2.8 DARTCOM satellite imaging system.		Yes

4. Sensors and Moorings.		AGR QUE - PART 1 : Equipment Pool SECTION A : Portable Equipment
4.1 Moorings & mooring instrumentation.		Yes
4.3 CTD / rosette sampler systems (Stainless steel).		Yes
4.5 Moving vessel profiler (MVP300).		Yes
4.6 CI FASTRACKA FRRF.		Yes
4.8 Salinometer.		Yes
4.9 XBT/XCTD System.		Yes
4.11 L ADCP RDI WH monitor 300kHz (6000m depth rating - 2 off).		Yes

5. Miscellaneous		AGR QUE - PART 1 : Equipment Pool SECTION A : Portable Equipment
5.1 -85 degree centigrade freezer.		Yes
5.1 -20 degree centigrade freezer.		Yes
5.1 Refrigerators.		Yes
5.2 Gas bottle storage racks.		Yes
5.4 User supplied storage container.		Yes

QUE - PART 1 : Equipment Pool SECTION B : Ship Fitted Equipment

1. RRS Discovery		AGR QUE - PART 1 : Equipment Pool SECTION B : Ship Fitted Equipment
Seismic Air Compressor / Delivery Systems is required.		
Computing Systems [scientific data acquisition] are required.		Yes
Pumped Sea Water Sampling System [from 6m depth] is required.		Yes
Sea Surface Monitoring System [salinity, temperature, transmissometer, fluorimeter] are required.		Yes
Meteorology Monitoring Package is required.		Yes
150 kHz Hull Mounted ADCP System is required.		Yes
75 kHz Hull Mounted ADCP System is required.		Yes
Ultra Short Base Line Acoustic Navigation is required.		
Hull Mounted Wave Height Recorders are required.		Yes

QUE - PART 1 : Equipment Pool SECTION C : Full Equipment Descriptions

1.1 Radio Nuclide Container		AGR QUE - PART 1 : Equipment Pool SECTION C : Full Equipment Descriptions
Do you require a Fume Hood.	Yes	
What substances do you want to use in the fume hood		
NMF will supply two RN containers from the NMEP if possible. update 15/11/07. NMF cannot at present supply two RN containers NMF Sea Systems will ensure best efforts are made to supply the containers fully tested and operational. Fume cupboard chem lists to be with NMF Sea Systems by 15th March: mail to nmfss-ops@noc.soton.ac.uk		
Do you require a container Millipore.		
Do you require compressed air/other gas.		
Please state below any specific container layout/requirements, and preference of deck installation i.e. Aft deck, upper deck etc:		
After deck.		
How many NMF-SS alarm boards required. NMF-SS use only		
Deck bed plates/deck shoes required. NMF-SS use only	1	
State location of containers on deck. NMF-SS use only		
STBD side after Deck		
Please give additional details on the use of the Radio Nuclide Container.		
RN Container with kick out windows to be sited in aft deck.		

1.1 Clean Chemistry Containers		AGR QUE - PART 1 : Equipment Pool SECTION C : Full Equipment Descriptions
Do you require a Laminar Flow Hood.	Yes	
Do you require a container Millipore.		
Do you require compressed air/other gas.	Yes	
Please state below any specific container layout/requirements, and preference of deck installation i.e. Aft deck, upper deck etc:		
One clean chem container requested, to be situated on the fore deck container position.		
How many NMF-SS alarm boards required. NMF-SS use only.		
Deck bed plates/deck shoes required. NMF-SS use only.		
State location of containers on deck. NMF-SS use only.		
Fore deck		
Please give additional details on the use of the Clean Chemistry Container.		
PML plan to pipe Helium into the container. PML will supply all pipework, regulators and distribution equipment, they need access to a container bulkhead penetration only. 3 bottle gas bottle rack required to secure bottle outside container (possibly not required if smaller gas bottles are used, which can be kept inside the container lab).		

1.2 Ship Fitted Environmental Fume HoodAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions

Please state the number of Fume Hoods required. 1

What substances will be used in the Fume Hoods.

1 fume hood in the ships chemistry lab.

Complete list of substance to be used in each individual fume hood to be sent to NMF Sea Systems by the 15th March 2008.

1.2 Ship Fitted Laminar Flow CabinetAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions

Please state the number of Laminar Flow Cabinets required. 1

What substances will be used in the Laminar Flow Cabinets.

1 laminar flow hood in the ships deck lab.

Complete list of substance to be used in each individual fume hood to be sent to NMF Sea Systems by the 15th March 2008.

1.3 Laboratory Hydrogen Gas GeneratorAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**Please give details about the use of Laboratory Hydrogen Gas Generator - including the volume (in litres/minute) required.**

NMF Sea Systems to supply 2 off Hydrogen gas generators (TBCF) - these will be supplied for use with GCs therefore their reliability is critical, one will be sent as backup. PML will also send an additional unit.

To be located in the deck lab.

1.3 Laboratory Pure Air Gas GeneratorAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**Please give details about the use of the Pure Air Gas Generator - including the volume (in litres/minute) required.**

To replace the requirement to ship multiple bottles of air to the ship.

1.3 Laboratory Nitrogen Gas GeneratorAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**Please give details about the use of the Nitrogen Gas Generator - including the volume (in litres/minute) required.**

Backup for gas bottles.

1.3 Laboratory Liquid Nitrogen GeneratorsAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**Please give details about the use of the Liquid Nitrogen Generator - including the volume (in litres/minute) required.**

Required for sample processing throughout the cruise. There will be a heavy requirement for Liquid N2 at the end of the cruise to charge dry shippers. Scientific and NMF Sea Systems staff will endeavour to ensure any excess production of LN2 during the cruise is decanted to dewars

1.5 Ship Fitted Laboratory Pure Water SystemsAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions

Estimate the required daily volume of RO water (in litres). 50

Estimate the required daily volume of Polished water (in litres). 120

Please give additional details about the use of the Laboratory Pure Water Systems.

2 systems required; Container lab and deck lab

1.6 Underway Water Sampling System (Trace Metal Spec.)

**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

What equipment do you require to use the Underway Water Sampling System with.

TBC

1.7 Liquid Scintillation Counter

**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Please detail the work to be carried out in the LSC.

TBC

2.4 Precision Echo Sounder (10khz / 12Khz PES)

**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Do you require a colour hard copy print.

Do you require the 'Waverley 3710' line scan recorder.

Do you require the PES beam steering facility.

Please add any additional details concerning the use of the Precision Echo Sounder.

General echo sounding operations plus MVP signal input.

2.8 Dartcom Satelite Imaging System

**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Please give details of your required use of this ship fitted equipment.

General operations, no processing required.
PML will be transmitting sat' images to the ship on a regular basis.

4.1 Sensors and Moorings**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Uploaded file containing a mooring map.	No files uploaded
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List type and number of sensors requested from NMF-SS equipment pool.

GONIO requested.

PML have requested NMEP provide 2 off drifting buoys if they are available together with the GPS comms systems. NMF SS to confirm whether there are any within the NMEP.

PML currently have 4 complete systems.

Give details of sensor ranges/resolutions (in meters).

Sea Systems to confirm resolution of Star Oddies. 20 sensors req'd.

PML/Sea Systems to confirm build of drifters and thermistor chain.

Actions on Dougal to contact Fernando.

State sensor depths (in meters, from surface, or heights off bottom).

Dependent on area of cruise but mixed layer and top of thermocline. Max depth 200m but more likely <100m.

State the duration of mooring deployment.

Duration of experiment (35 days).

Geographical location of mooring deployment.

West African shelf edge.

Details of topography at mooring site.

N/A

Details of current profile extremes.

Not known but unlikely to be large.

Is Argos mooring monitoring required

Yes for drifting buoys.

Are budgetary constraints to be applied to mooring design.

Any build or procurement costs to be advised to PSO prior to proceeding.

Please state proposed recovery ship.

Ship used for deployment.

Please add any further comments as required.

Low profile surface drifting buoys (5 in water at once), with GPS transmitters to ship and satellite, PML to locate a PC on the bridge. Argos and DF locators used as part of marking the SF6 seeding experiment. Drogues for above, 3m in length, deployed and recovered by hand. PML will supply Radio DF deck unit. Instrument string will be attached to two of the drifters.

4.3 CTD Systems (Stainless Steel)**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Do you require a 12 or 24 bottle frame/rosette.	24
Do you wish to carry out trace metal work.	
Do you wish to carry out CFC work.	
Do you require 10Ltr or 20Ltr bottles for the CTD frame.	20
Do you require GOFLO bottles to be fitted to the CTD frame.	
1. Seabird 911 CTD :	Yes
2. Transmissometer :	Yes
3. Fluorimeter :	Yes
4. Oxygen sensor :	Yes
5. Light scatter sensor :	Yes
6. PAR sensor :	Yes
7. Pinger :	Yes
8. Altimeter :	Yes
9. Other :	Yes
Estimate the maximum number of deployments.	300
Estimate the minimum depth for casts (in meters).	10
Estimate the maximum depth for casts (in meters).	1000
Estimate the salinity samples numbers per casts.	4
Do you require NMF-SS to supply salinity bottles and caps.	Yes
Estimate salinity samples to be taken per day from online sea water supply.	2
Specify what level of support you want from NMF-SS staff for salinity sampling.	UKORS to carry out all salinity sampling.
Do you require NMF-SS to supply standard sea-water for salinity sampling.	Yes
Do you anticipate continuous 24hr CTD operations.	Yes
Specify any additional requirements for the CTD system.	
Standard SBE processing required. Additional CTD system requested as backup. 2 off 300kHz frame mounted ADCP required; 1 up/1 down. 1 off FRRF frame mounted requested.	

4.5 Moving Vessel Profiler (MVP)**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

1. AML CTD :	Yes
2. Oxygen sensor :	Yes
3. Fluorometer :	Yes
4. Up and downward TIR :	Yes
5. Tilt & roll :	Yes
1. AML CTD :	
2. Satlantic nutrient sensor :	
3. Up and downward TIR :	
4. Tilt & roll :	
5. Flourometer :	
6. Oxygen :	
Estimate length of survey line(s) (in nautical miles).	600
Estimate number of deployments.	4

Please give any additional details of your required use of this equipment.

The MVP is a critical tool for this cruise, it is required to survey the target areas to identify the position and extent of the bloom/upwelling.

Fish2 was the preferred sensor platform but as it is still unavailable fish1 is requested.

The MVP is a watch kept deployed sensor platform, all operations must be operated in this manner no 'automatic' operations can be carried out. If Sea Systems staff are not available to operate the equipment at first hand then the MVP must not be deployed.

Scientific staff will take responsibility for data processing.

It is noted that the MVP will take a lot of time to manage and in the event of equipment breakdown (MVP or other) NMF SS staff could possibly run out of hours requiring deployment downtime, the only solution to this is to sail an additional technician but this is not attractive to the science party due to the requirement for as many scientists to sail as possible.

Due to updated use figures a fifth NMF technician will be embarked.

Large MSFFF requested if available at this point.

4.6 CI FASTRACKA FRRF**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

How many FRRF's do you require.	3
Do you plan to use an FRRF deployed on a frame.	Yes
Do you plan to use an FRRF vehicle mounted.	Yes
Do you plan to use an FRRF bench mounted.	Yes

Please give any additional details of your required use of this equipment.

1 off CTD frame mounted.

1 off mounted on the PML optics rig.

1 off lab based online or for discreet sampling.

4.8 Salinometers**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Do you require a Portasal or Autosal. Autosal

How many instruments do you require. 2

Please give additional details about the use of the Salinometers system.

2 off 8400B systems to be supplied, 1 in use and 1 for backup. To be fitted in CT lab if possible.

4.9 XBT/XCTD Systems**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

How many XBT deployments do you wish to carry out. 20

How many XCTD deployments do you wish to carry out.

Please give additional details about the use of the XBT/XCTD systems.

PML to provide probes, NMF to provide launcher and PC.
To be used in event of MVP and CTD failure.**4.11 SC ADCP / L ADCP option - L ADCP RDI WH Monitor 300kHz****AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

How many requested. 2

How do you wish to deploy the instruments. Fixed to a frame

Please give additional details about the use of the SC ADCP / L ADCP.

2 off CTD frame mounted, 1 up and 1 down.
Science party to configure ADCP prior to deployment.**5.1 -85 Degree Centigrade Freezer****AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Please give details of samples/materials to be stored.

1 requested for sample storage.

Please give the storage volume required (in cubic feet).

5.1 -20 Degree Centigrade Freezer**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Please give details of samples/materials to be stored.

2 requested for sample storage.

Please give the storage volume required (in cubic feet).

5.1 Fridges and Ice Maker**AGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions**

Please give details of samples/materials to be stored.

2 fridge requested for sample storage.
Ice maker not required.(3/03/08)

Please give the storage volume required (in cubic feet).

5.2 Compressed Gas Bottle Storage RacksAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions

Estimate numbers gas bottles to be stored. 40

Please indicate the sizes of gas bottles to be stored.

PML to supply bottle racks, NMF to supply 2 off small 'in-line' bottle racks to be located port side and outside the Chief Officers cabin.

5.4 User supplied storage containerAGR QUE - PART 1 : Equipment Pool
SECTION C : Full Equipment Descriptions

Deck bed plates/deck shoes required. NMF-SS use only 1

Please give additional details about the use of the User Supplied Storage Container including the location on deck.

If space is available on the deck a 20ft PML container may sail with the vessel.

QUE - PART 1 : Equipment Pool SECTION D : Full Ship Fitted Systems Descriptions

Surface Pumped Sea-water Sampling SystemAGR QUE - PART 1 : Equipment Pool
SECTION D : Full Ship Fitted Systems Descriptions

Is the requirement for continuous use throughout the cruise. Yes

What equipment is to be used with this water supply.

TSG, discreet sampling.

Sea Surface Monitoring SystemAGR QUE - PART 1 : Equipment Pool
SECTION D : Full Ship Fitted Systems Descriptions

Salinity : Yes

Surface Temp : Yes

Transmission : Yes

Fluorescence : Yes

Please give additional details about the use of the Sea Surface Monitoring System.

Meteorology Monitoring PackageAGR QUE - PART 1 : Equipment Pool
SECTION D : Full Ship Fitted Systems Descriptions

Wind direction/speed : Yes

Barometric pressure : Yes

Air temp/humidity : Yes

Light meters : TIR - Total irradiance Yes

Light meters : PAR - Photo synthetic radiation Yes

Please give additional details about the use of the Meteorology Monitoring Package.

75kHz Acoustic Doppler Current Profiler (ADCP)	AGR QUE - PART 1 : Equipment Pool SECTION D : Full Ship Fitted Systems Descriptions
Bin numbers :	
BIN numbers, set up and slave/master requirements to be determined on board - contact - Ricardo, PML.	
Preferred Software :	DAS/UE4

150kHz Acoustic Doppler Current Profiler (ADCP)	AGR QUE - PART 1 : Equipment Pool SECTION D : Full Ship Fitted Systems Descriptions
Bin numbers :	
BIN numbers, set up and slave/master requirements to be determined on board - contact - Ricardo, PML.	
Preferred Software :	DAS/UE4

Wave Height Recorder	AGR QUE - PART 1 : Equipment Pool SECTION D : Full Ship Fitted Systems Descriptions
Please indicate the level of use you anticipate from the Wave Recorder.	
To be run and logged for the duration of the cruise.	

QUE - PART 1 : Equipment Pool SECTION E : Shipboard Fitted Computing

Shipboard Fitted Computing Systems	AGR QUE - PART 1 : Equipment Pool SECTION E : Shipboard Fitted Computing
Do you require user supplied equipment to be interfaced to the ships computing system (for data logging).	Yes
Do you require data outputs from the ships computing systems to be connected to your equipment. E.g. Gyro, EM Log, GPS, ships clock etc.	Yes
Please estimate number of PCs/Workstations to be connected to the Ship borne LAN or computer peripherals (printers, plotters).	25
Specify data format for archive :	User Defined ASCII
Do you require ARGOS position data/satellite images to be transferred to the ship	Yes
Is DGPS critical to your cruise operations.	Yes
Do you require ship to shore communications (E-mail).	Yes
To what extent will you want any Seabird CTD data post-processed.	STD Seabird package
Please give additional details about the use of the Shipboard Fitted Computing Systems.	
Sat' images emailed to ship on regular basis.	

Data Logging Requirements		AGR QUE - PART 1 : Equipment Pool SECTION E : Shipboard Fitted Computing
ASHTEC: Attitude detection :	Yes	
EA500 Echo Sounder (Depth) :	Yes	
Trimble GPS 4000 :	Yes	
ADCP: 150Khz, 75Khz: DAS required for logging :	Yes	
EM Log: (Ship speed) :	Yes	
Gyro compass :	Yes	
Underway Sea-surface sampling: Salinity, temperature, transmission, fluorescence.	Yes	
Meteorology Package: PAR/TIR Light Sensors, Wind speed. Air temperature, pressure, humidity.	Yes	
Please identify other sources to be logged.		
MVP (logged to network)		

QUE - PART 2 : User Supplied Equipment SECTION A : User Supplied Equipment

1. User Supplied Equipment		AGR QUE - PART 2 : User Supplied Equipment SECTION A : User Supplied Equipment
Name	Description	
N2O / CH4 analysers	2 off bench mounted in deck lab. 1.5m x 0.5m x 1m; non-toxic plus 240v required.	
Deck incubators	Up to 6m sq; to be located on deck in open space, position to be determined on deck plan. Gavin Tilstone to confirm details. Also requirement for Lab incubators to come from Gavin.	
Nutrient analyser		
Turbulence probe	PME instrument. Hand deployed. 5kg self contained device PI to confirm to NMF Sea Systems what this equipment is and detail installation and deployment requirements.	
OVOCs analyser	Lab instrument.	
VIC analyser	Lab instrument.	
SF6 tank on deck	2m x 2m x 1.5x; 1Te empty; 7Te if foll. SF6 to be piped into tank filled with water, saturated water to be released into the sea over an 8 to 10hr period at approx' 2 - 4knts. As per D320.	
Drifting buoys	Low profile surface drifting buoys (6), with GPS transmitters to ship and satellite, PML to locate a PC on the bridge. Argos and DF locators used as part of marking the SF6 seeding experiment. Drogues for above, 3m in length, deployed and recovered by hand.	
Optics Rig	Winch to be supplied by NMF. Wire supplied by PML. No counting sheave req'd.	
UEA Atmospheric Samplers	To be installed on Monkey Island (2 off) 240v AC supply.	

QUE - PART 3 : Laboratory Space SECTION A : Laboratory Space

Laboratory Space	AGR QUE - PART 3 : Laboratory Space SECTION A : Laboratory Space
Main Laboratory	
CTD / General sampling equipment.	
Deck/Wet Laboratory	
Liquid scintillation counter / Millipore /	
Scientific Plot	
Ricardo Torres	
Chemistry Laboratory - Discovery only	
Fume hood / general sampling equipment	
Controlled Temperature Laboratory	
Salinometer	
Scientific Cold Room	
Samples. +4degC ?	
Dark Room	
Samples. +4degC ?	
Hanger - Discovery only	
Liquid Nitrogen generator. Pure air gen. Gavin Tillstone	
Water Bottle Annexe - Discovery only	
TSG / Sampling	

QUE - PART 4 : Hazardous Substances SECTION A : Hazardous Substances

2. Radioactive Isotopes		AGR QUE - PART 4 : Hazardous Substances SECTION A : Hazardous Substances
Please give the name of the nominated scientist for isotope activities on board the vessel.	Andy Rees	
Which Institute or University is responsible for waste disposal and de-contamination of working areas.	PML	
State which isotopes are to be used on board the vessel.		
C14 bicarbonate C14 Leucine C14 CH3OH H3 CH3OH M35 Methionine (1mCi) P33 Phosphate (1mCi) Tritiated Glucose (0.25mCi) Tritiated Leucine (1mCi)		
State activities of each isotope.		
Complete details to follow by 1/4/2008		
State type of monitoring instrument to be used on the vessel.	Complete details to follow by 1/4/2008	
State monitoring instrument expiry date.	Complete details to follow by 1/4/2008	
Estimate volume and activity of waste likely to be generated during the cruise.	400litres of aqueous samples plus liquid scintalants and other dry samples.	
What arrangements are in place to remove and dispose of the waste (including filters) generated during the cruise	All radio isotope samples, used ancillary and supporting lab items and aqueous	

3. Compressed Gas		AGR QUE - PART 4 : Hazardous Substances SECTION A : Hazardous Substances
Please state type of gas bottles to be loaded on the vessel.	Various.Complete details to follow by 1/4/2008	
Please state the number of gas bottles to be loaded on the vessel.	40	
Please state size of gas bottles to be loaded on the vessel.	Various. Complete details to follow by 1/4/2008	
Please state where gases are to be used within the ship space.	Hanger, aft deck, port walkway, stbd deck.	
Please give additional details about the use of Compressed Gas.		
Large quantities of gas will be supplied and used during the cruise. PML will supply most of the gas racks, NMF will supply the small 'inline' racks to be located on the port walkway and outside the Ch' Officers cabin.		

4. Chemicals		AGR QUE - PART 4 : Hazardous Substances SECTION A : Hazardous Substances
Name	UN Number	
Malcolm to supply by	1/4/2008	

AGR - PART 4 Section A : Outstanding Matters Relating to the Questionnaire

Questionnaire matters arising	AGR AGR - PART 4 Section A : Outstanding Matters Relating to the Questionnaire
Please enter comments	
Possible use of work boat (TBCF) NMF will supply a Turbulence probe.	
Non Toxic needs to be cleaned and flushed at all discharge points before cruise commences.	
Non Toxic temperature sensors, requirement to see up to date calibration certs	

AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches

1. Discovery - Ship fitted winches CTD Winch (11.43MM Electrical Conducting Cable)	AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be deployed on the wire	
24 bottle CTD system	
Equipment weight (in kilograms)	850
Estimate number of days	30
Estimate number of deployments	150
What is the maximum water depth (in meters)	1000

1. Discovery - Ship fitted winches CTD Winch (11.43MM Optical/Electrical Cable)	AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be deployed on the wire	
24 bottle CTD system - backup	
Equipment weight (in kilograms)	850
Estimate number of days	30
Estimate number of deployments	150
What is the maximum water depth (in meters)	1000
Do you require the fibre optic facility	

**1. Discovery - Ship fitted winches
Deep Tow Winch Electro Optical :17:3m**

**AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only
SECTION A : Wires and Winches**

Equipment to be deployed on the wire

Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	
What is the maximum water depth (in meters)	
What is the estimated towing speed, if any (in knots)	
Do you require the fibre optic facility	

**1. Discovery - Ship fitted winches
Coring Winch (Direct Pull Winch System (16.5MM 3*19))**

**AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only
SECTION A : Wires and Winches**

Equipment to be deployed on the wire

Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	
What is the maximum water depth (in meters)	

**1. Discovery - Ship fitted winches
Trawl Winch - Tapered Wire Rope (14.5mm/16.5mm/18mm - Traction Winch System)**

**AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only
SECTION A : Wires and Winches**

Equipment to be deployed on the wire

Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	
What is the maximum water depth (in meters)	

**1. Discovery - Ship fitted winches
Deep Water Coring**

**AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only
SECTION A : Wires and Winches**

Equipment to be deployed on the wire

Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	
What is the maximum water depth (in meters)	

**3. Portable winches
Hydrographic (6MM 3*19) or CTD (8mm) Conducting Winch Systems**

**AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only
SECTION A : Wires and Winches**

Equipment to be deployed on the wire

Backup to ship fitted system	
Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	
What is the maximum water depth (in meters)	

**3. Portable NMEP winch [1]
Other deck mounted winches**

**AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only
SECTION A : Wires and Winches**

Equipment to be deployed on the wire

Deck winch required for optics rig.	
Equipment weight (in kilograms)	50
Estimate number of days	10
Estimate number of deployments	10
What is the maximum water depth (in meters)	200

**3. Portable NMEP winch [2]
Other deck mounted winches**

**AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only
SECTION A : Wires and Winches**

Equipment to be deployed on the wire

Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	
What is the maximum water depth (in meters)	

3. Portable NMEP winch [3] Other deck mounted winches		AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be deployed on the wire		
Equipment weight (in kilograms)		
Estimate number of days		
Estimate number of deployments		
What is the maximum water depth (in meters)		

3. Portable NMEP winch [4] Other deck mounted winches		AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be deployed on the wire		
Equipment weight (in kilograms)		
Estimate number of days		
Estimate number of deployments		
What is the maximum water depth (in meters)		

3. Portable NMEP winch [5] Other deck mounted winches		AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be deployed on the wire		
Equipment weight (in kilograms)		
Estimate number of days		
Estimate number of deployments		
What is the maximum water depth (in meters)		

3. Portable NMEP winch [6] Other deck mounted winches		AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be deployed on the wire		
Equipment weight (in kilograms)		
Estimate number of days		
Estimate number of deployments		
What is the maximum water depth (in meters)		

4. Discovery - Overside handling system Stern 30TM	AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be lifted with this crane	
Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	

4. Discovery - Overside handling system Midships 75TM	AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be lifted with this crane	
Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	

4. Discovery - Overside handling system Midships 150TM	AGR AGR - PART 5 : Winches Wires and General Planning - NMF-SS Only SECTION A : Wires and Winches
Equipment to be lifted with this crane	
Equipment weight (in kilograms)	
Estimate number of days	
Estimate number of deployments	

AGR - PART 6 : Hazardous material Section A : Hazardous material

Hazardous material matters arising	AGR AGR - PART 6 : Hazardous material Section A : Hazardous material
Please enter comments	
Chemical, gases and radio isotopes will be used during this cruise. PML will forward all details by 1/4/2008.	

AGR - PART 7 : Health and safety Section A : Health and safety

AGR - PART 7 : Health and safety Section A : Health and safety

AGR - PART 8 : Additional Uploads Additional Uploads

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