

**NATURAL ENVIRONMENT RESEARCH COUNCIL
(BRITISH ANTARCTIC SURVEY)**

APPLICATION FOR CONSENT TO CONDUCT MARINE SCIENTIFIC
RESEARCH IN AREAS UNDER NATIONAL JURISDICTION OF

Iceland

1. General information

Application Date

Feb 6, 2012

1.1	Cruise name and/or number	JR267
1.2	Sponsoring institution. Name Address Name of Director	British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET , UK Professor Nick Owens
1.3	Scientist in charge of the project. Name: Address Telephone Fax/Email/Telex	Robert S. Pickart MS 21 Woods Hole Oceanographic Institution Woods Hole, MA 02543 USA Ph 508-289-2858 Fax 508-457-2181 rpickart@whoi.edu
1.4	Scientist(s) from, (name coastal state), involved in the planning of the project. Name(s) Address	Iceland: Dr. Hedinn Valdimarsson Marine Research Institute Skulagata 4 , 121 Reykjavik Phone: 354-5752000 Email: hv@hafro.is Dr. Steingrimur Jonsson University of Akureyri 600 Akureyri, Iceland Phone: 460 8000 Email: steing@unak.is
1.5	Submitting officer Name Address Telephone Fax/Email/Telex	Mr Chris Hindley (Ship Operations and Programme Manager) British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET , UK + 44 1223 221497 +44 1223 362616 cjhh@bas.ac.uk No Telex

2. Description of project (Attach additional pages as necessary)

2.1 Nature of objectives of the project

This project investigates the sources of water feeding the Denmark Strait Overflow Water, and the role of freshwater in modulating the formation of the dense water. It is a collaborative field program between the Woods Hole Oceanographic Institution, the Marine Research Institute of

Reykjavik, the University of Akureyri, the University of Bergen, and the Netherlands Institute for Sea Research. Our approach is to deploy a year-long set of moorings from August 2011 to August 2012, and carry out a shipboard hydrographic/velocity survey of the surrounding regions during the mooring deployment and recovery cruises. Moorings will be maintained upstream of the Denmark Strait sill in the major components of the circulation, as well as in the overflow water at the sill itself (see the attached figure showing the mooring locations and the tentative shipboard survey in 2012). The main scientific objectives of the program are to quantify the different water mass components, transports, and pathways feeding the overflow water; understand the dynamics of the warm-to-cold conversion of water that forms the overflow water; and elucidate the role of freshwater emanating from the Arctic in modulating the formation and downstream evolution of the overflow water.

2.2 Relevant previous or future research cruises

We carried out a hydrographic cruise in October 2008 to map the circulation immediately north of the Denmark Strait.

We carried out a mooring/hydrographic cruise in August/September 2011 to deploy moorings north of Denmark Strait and to investigate the pathway and source of the North Icelandic Jet – one of the two main pathways of dense water into the strait.

2.3 Previously published research data relating to the project

Våge, K., R. S. Pickart, M.A. Spall, H. Valdimarsson, S. Jonsson, D.J. Torres, S. Osterhus, T. Eldevik, 2011: Significant role of the North Icelandic Jet in the formation of Denmark Strait Overflow Water. *Nature Geoscience*, 4 723-727. doi:10.1038/ngeo1234

3. Methods and means to be used

3.1 Particulars of vessel

Name	RRS James Clark Ross
Nationality/Registry	British (Falkland Island Registration)
Owner	Natural Environment Research Council (NERC)
Operator	British Antarctic Survey
Length Overall	99.04m
Max. Draft	6.4m
Net /Gross Tonnage	Net: 1719 Tonnes Gross: 5732 Tonnes
Propulsion	Diesel Electric, Single Fixed Prop 8500 SHP
Cruising Speed	11.5 Kts Maximum speed: 16 kts
Call Sign	ZDLP
Method and capability of communication	Inmarsat: Voice 00870 374 033920 / Fax 374 033924 VOIP Telephone: +44 1223 221 725/6/8 Email: jrmaster@bas.ac.uk
Name of Master	Captain G Chapman
Number of crew	28
Number of Scientists and Technicians	31

3.2 Aircraft or other craft to be used in the project

none

3.3 Particulars of methods and scientific instruments (increase table size if needed)

Types of samples and data	Methods to be used	Instruments to be used
Temperature, salinity, velocity	Subsurface Moorings	MicroCats, SBE19s, CTD moored profilers, point current meters (RCMs, Aquadopps), current profilers (ADCPs)
Temperature, salinity, transmissivity, fluorescence, oxygen	Lowered from ship	CTD attached to Rosette
Velocity	Lowered from ship	Lowered ADCP attached to Rosette
Salinity, oxygen, O-18, CDOM	Lowered from ship	Niskin Bottles attached to Rosette
Velocity	Measured from ship	Hull-mounted ADCP

3.4 Indicate whether harmful substances will be used

Hydrochloric Acid (HCL) is used for measuring CDOM, for cleaning purposes only (rinsing of containers). The total amount is 5L, stored in polycarbonate bottles.

3.5 Indicate whether drilling will be carried out

None

3.6 Indicate whether explosives will be used

None

4. Installations and equipment

Details of installations and equipment (dates of laying, servicing, recovery; exact locations and depth):

Subsurface Moorings will be serviced at the following locations:

Name	Lat (N)	Lon (W)	Bot (m)	Action
HAFRO-DS1	66 4.61	27 4.88	656	(recover/deploy)
WHOI-DS1	67 12.81	23 31.86	273	(recover)
WHOI-DS2	67 16.41	23 35.30	402	(recover)
WHOI-DS3	67 20.30	23 37.87	500	(recover)
WHOI-DS4	67 24.96	23 41.52	620	(recover/deploy)
WHOI-DS5	67 29.28	23 45.06	750	(recover)
HAFRO-KGA6	67 34.80	23 53.46	949	(recover)
HAFRO-KGA7	67 42.14	24 9.28	1247	(recover)
NIOZ-DS5	67 52.14	24 30.72	1459	(recover)
NIOZ-DS4	68 1.38	24 51.15	1298	(recover)
WHOI-DS6	68 9.18	25 7.45	900	(recover)
UIB-KGA-11	68 12.36	25 13.89	555	(recover/deploy)
NIOZ-DS3	68 19.31	25 29.57	302	(recover/deploy)
HAFRO-HB3	67 8.79	21 18.68	233	(recover/deploy)
IFM-PIES	67 24.04	23 41.60	600	(recover/deploy)

5. Geographical areas

- 5.1 Indicate geographical areas in which the project is to be conducted (with reference in latitude and longitude)

65N – 79N , 30W – 2E

- 5.2 Attach chart (s) at an appropriate scale showing the geographical areas of the intended work and, as far as practicable, the positions of intended stations, the tracks of survey lines, and the locations of installations and equipment.

See the attached chart for mooring locations and the attached chart for tentative CTD transects.

6. Dates

- 6.1 Expected dates of first entry into and final departure from research area by the research vessel:

July 25, 2012

August 30, 2012

- 6.2 Indicate if multiple entry is expected Yes/No

No

Dates if known

7. Port Calls

- 7.1 Dates and names of intended ports of call in Iceland

Reykjavik for mobilisation – arrival between 23/7/2012 and 5/8/2012

- 7.2 Any special logistical requirements at ports of call

none

- 7.3 Name(s) and Address/Contact details of shipping agent (if known)

Nesskip HF, Austurstrond 1, 170 Saltjarnarnes, Reykjavik,

8. Participation

- 8.1 Extent to which (name of coastal state),

Iceland

will be enabled to participate or to be represented in the research project.

Active collaboration.

- 8.2 Proposed dates and ports for embarkation/disembarkation

Port of embarkation: Reykjavik, Iceland; July 25, 2012

Port of disembarkation: Longyearbyen, Norway; August 30, 2012

9. Access to data, samples and research results

For (name of coastal state)

Iceland

9.1 Expected dates of submission of preliminary reports which should include the expected dates of submission of the final results.

February 1, 2013

9.2 Proposed means for access to data and samples

Website and/or ftp.

9.3 Proposed means to provide the assessment of data, samples and research results or provide assistance in their assessment or interpretation

Publications and Collaborations.

9.4 Proposed means of making research results internationally available

National database in US.

10. COMPLETE THE FOLLOWING TABLE - SEPARATE PAGE FOR EACH COASTAL STATE:

Name of Coastal State Iceland

Port Calls/Dates As per section 7 above

List Scientific Work by Function eg: Magnetometry Gravity, Diving, Seismic, Bathymetry, Seabed Sampling, Trawling, Echo Sounding, Water Sampling U/W T.V.: Moored and Towed instrument	Water Column Incl. Sediment Sampling on the Seabed	Fisheries Research within Fishing Limits	Research Concerning the Natural Resources of the Continental Shelf or its Physical Characteristics	Distance from Coast	
				Within 12 NM	Between 12 - 200 NM
Bathymetry	Yes	No	No	0-3 NM	
CTD	Yes	No	No	0-3 NM	
Water samples	Yes	No	No	0-3 NM	
Acoustic profiling	Yes	No	No	0-3 NM	
Atmospheric profiling	No	No	No	N/A	
List other Equipment					

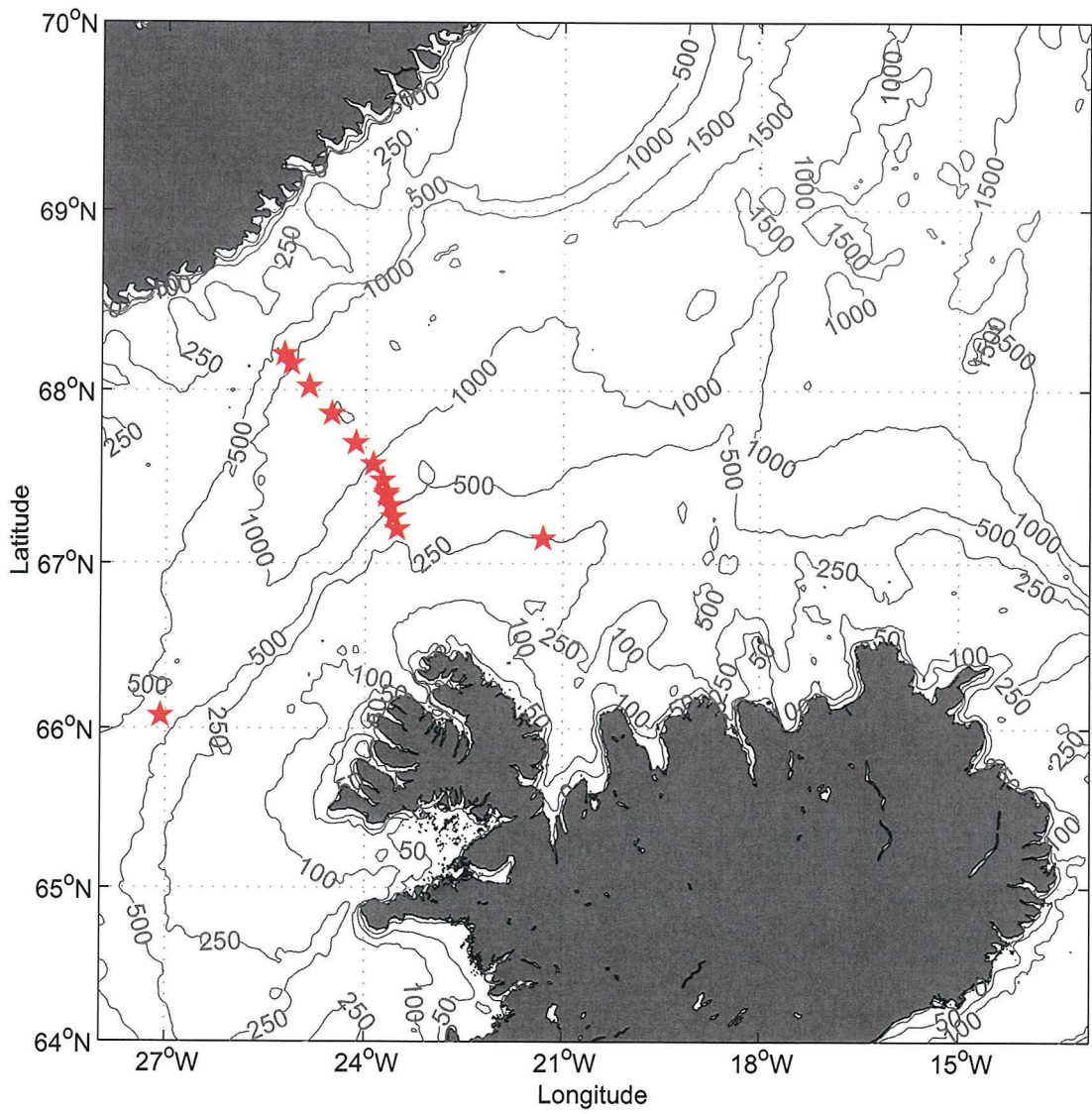
Signed on behalf of the Principal Scientist (See Section 1.3 above)



**CJ H Hindley – Ship Operations and Programme Manager,
British Antarctic Survey (See Section 1.5 above)**

Mooring Positions for JR267

Name	Lat (N)	Lon (W)	Bot (m)	(Action)
HAFRO-DS1	66 4.61	27 4.88	656	(recover/deploy)
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Tentative CTD transects during JR267

