NOTIFICATION OF PROPOSED RESEARCH CRUISE

GENERAL

Part A

01.	Name of research ship:	***M E T E O R***	**Cruise No. M 85/2**
02.	Dates of cruise	**from August 5th St. John's to August 25th 2011 Reykjavik**	
03.	Operating Authority	***IFM-GEOMAR / University of Kiel***	
		Duesternbrooker Weg 20, D-24105 Kiel, Germany	
		Tel.: +49-431-600-4101 - Fax: +49-431-600-4102	
04.	Owner (if different from para 3)	***Federal Ministry of Education and Research***	
05.	Particulars of ship:	Name	***METEOR***
		Nationality	***German***
		Overall length	***97,5 metres***
		Maximum draught	***5,6 metres***
		Nett tonnage	***1284.0 NRT***
		Propulsion	***Diesel Electric***
		Call sign	***D B B H***
06.	Crew	Name of master	**T. Wunderlich**
		No. of crew	**max. 34**
07.	Scientific personnel:	Name and address of scientist in charge	**Dr. Johannes Karstensen Duesternbrooker Weg 20 24105 Kiel**
		Tel./Fax/	**+49 (431) 600-4156 +49 (431) 600-4152**
		E-Mail	***jkarstensen@ifm-geomar.de***
		No. of scientists	**max. 30**

08. Geographical areas in which ship will operate (with reference in latitude and longitude)

a) Labrador Sea 45 - 50 N, 40 - 60 W

b) East Greenland Continental Slope, Denmark Strait 56 - 68 N, 20 - 50 W

09. Brief description of purpose of cruise

The physical oceanographic work during this cruise is aimed at quantifying the strength of the Atlantic Overturning Circulation, an important part of the global ocean circulation. The work comprises the recovery and re-deployment of autonomous instrumentation (floats, moorings) and shipboard observations of meteorological and physical oceanographic parameters in the water column (temperature, salinity, oxygen, currents, sound velocity). The work is funded by the European Commission (project THOR) and by the German Ministry of Science.

10. Dates and names of intended ports of call

Reykjavik, Iceland for three days in a period from 22nd August – 30th August 2011 (intended so far 25th – 27th August 2011),

11. Any special logistic requirements at ports of call

Normal cargo handling, exchange of crew, bunkering.

DETAIL

Part B

01. Name of research ship **METEOR** Cruise No. **M 85/2**

02. Dates of cruise **from August 5th St. John's to August 25th 2011 Reykjavik**

03. Purpose of research and general operational methods

Long term study of the Meridional Overturning Circulation in the North Atlantic, in particular the spill-over of dense water from the Nordic Seas through Denmark Strait and the sinking of dense water in the Irminger and Labrador Seas. The mixing of these source waters within the water column and their spreading and export to the south will be surveyed. CTD (hydrography) and ADCP (current profiling) sections will be run across the major current systems and across the basins from the shallow shelves into the deep regions. At key locations moorings will be deployed.

04. Attach chart showing (on an appropriate scale) the geographical area of the intended work, positions of intended stations, tracks of survey lines, positions of moored / seabed equipment.
see attachment

05. Types of samples required, e.g. Geological / Water / Plankton / Fish / Radio-activity / Isotope

water, hydroacoustic data

and methods by which samples will be obtained (including dredging / coring / drilling).

Water sampling during deep stations with CTD – Rosette, hydroacoustic measurements of currents from moving ship and during stations.

6. Details of moored equipment:

Mooring recoveries

Date deployed	Deployment vessel	Name - description	Latitude N	Longitude W
July 2010	RV Meteor	ADCP DS1-10 Current Meter M.	66° 04.61'N	27° 04.88' W
July 2010	RV Meteor	ADCP DS2-10 Current Meter M.	66° 07.23' N	27° 16.15' W

Mooring deployments

Date deployed	Date recovery	Name - description	Latitude N	Longitude W
August 2011	Summer 2012	ADCP DS7-11 Current Meter M.	66° 14.0' N	27° 41.0' W
August 2011	Summer 2012	ADCP DS6-11 Current Meter M.	66° 12.0' N	27° 35.0' W
August 2011	Summer 2012	ADCP DS5-11 Current Meter M.	66° 10.0' N	27° 29.0' W
August 2011	Summer 2012	P DS3-11 PIES-mooring	66° 09.0' N	27° 23.0' W
August 2011	Summer 2012	ADCPHHDS2-11 Current Meter M.	66° 07.2' N	27° 16.1' W
August 2011	Summer 2012	P DS4-11 PIES-mooring	66° 06.0' W	27° 10.0' W
August 2011	Summer 2012	ADCP DS1-11 Current Meter M.	66° 04.6' N	27° 05.6' W
August 2011	Summer 2012	ADCP DS8-11 Current Meter M.	66° 03.0' N	26° 57.0' W
August 2011	Summer 2012	ADCP DS9-11 Current Meter M.	66° 02.0' N	26° 52.0' W

07. Explosives: ***no explosives***

(a) Type and Trade name
(b) Chemical content
(c) Dept of Trade class and stowage
(d) Size
(e) Depth of detonation
(f) Frequency of detonation
(g) Position in latitude and longitude
(h) Dates of detonation

08. Detail and reference of

(a) Any relevant previous / future cruises

RRS Charles Darwin cruise 163/164 September 2004
WNA05 – Thalassa cruise in Summer 2005
RV Árni Friðriksson August 2005
RRS DISCOVERY cruise D311 September/October 2006
RV M.S. Merian cruise MSM05/2 May / June 2007
RV M.S. Merian cruise MSM05/4 July 2007
RV M.S. Merian cruise MSM12/1 May/June 2009
RV Meteor cruise M82/1 July 2010

(b) Any previous published research data relating to the proposed cruise. (Attach separate sheet if necessary.)

Avsic, T., J. Karstensen, U. Send, and J. Fischer (2006) Interannual variability of newly formed Labrador Sea Water from 1994 to 2005. Geophys. Res. Lett., 33, L21S02, 10.1029/2006GL026913

Böning, C.W., Scheinert, M., Dengg, J., Biastoch, A. and Funk, A. (2006) Decadal variability of subpolar gyre transport and its reverberation in the North Atlantic overturning: Geophysical Research Letters, 33, L21S01, doi:10.1029/2006GL026906.

Cunningham, S. et al. (2009) The present and future system for measuring the Atlantic Meridional Overturning Circulation and heat transport; OceanObs09, Cummunity White Paper.

Dengler, M., Fischer, J., Schott, F. A., and Zantopp, R. (2006) The Deep Labrador Current and its variability in 1996-2005, GRL, 33, L21506.

Dickson, B., S. Dye, S. Jónsson, A. Köhl, A. Macrander, M. Marnela, J. Meincke, S. Olsen, B. Rudels, H. Valdimarsson and G. Voet, 2008: The Overflow Flux west of Iceland: Variability, Origins and Forcing. In: Dickson RR et al.(eds): Arctic-Subarctic Ocean Fluxes. Springer Science + Business Media B.V., 443-474.

Fer, I., G. Voet, K.S. Seim, B. Rudels and K. Latarius (2010) Intense mixing of the Faroe Bank Channel overflow. Geophys. Res. Lett., 37, L02604, doi:10.1029/2009GL041924.

Friedrichs, A. (2009) Overflow in Denmark Strait: a vorticity balance. Bachelor thesis, University of Hamburg.

Karstensen, J., Avsic, T., Fischer, J., and Send, U. (2006) Subsurface temperature maxima in the Labrador Sea and the subpolar North Atlantic. Geophys. Res. Lett., 33, L21S05, 10.1029/2006GL026613

Käse, R.H. (2006) A Riccati model for Denmark Strait overflow variability. Geophys. Res. Let., 33, L21S09, doi:10.1029/2006GRL026915.

Kieke, D., M. Rhein, L. Stramma, W.M. Smethie and D. LeBel (2006) CFC inventory changes and formation rates of upper Labrador Sea Water in the subpolar North Atlantic, 1997 – 2001. J.Phys. Oceanogr., 36, 64-86.

Neumann, U. (2007) The influence of heat and freshwater fluxes on convective activity in the Central Irminger Sea . Diploma Thesis, University of Kiel.

Olsen, S.M.O., B. Hansen, D. Quadfasel, and S Østerhus (2008) Observed and modelled stability of overflow across the Greenland-Scotland ridge, Nature, 455, 519-523, DOI: 10.1038/nature07302.

Østerhus, S, T Sherwin, D Quadfasel, and B Hansen (2008) The overflow transport east of Iceland. In Dickson RR et al. (eds): Arctic-Subarctic Ocean Fluxes. Springer Science + Business Media B.V., 427-441.

Paka, V., B. Rudels, D. Quadfasel and V. Zhurbas (2009) A new tool to measure turbulence in the deep ocean: application to the Denmark Starit overflow. Doklady Akademii Nauk, submitted (in Russian).

Quadfasel, D and R Käse (2007) Present-Day Manifestation of the Nordic Seas Overflows. In: Ocean Circulation – mechanisms and impacts – past and future changes of the meridional overturning. Eds: A Schmittner, JCH Chiang, SR Hemming. Geophysical Monograph, 173, AGU, Washington DC, 75-90.

Schott , F. A., Fischer, J., Dengler, M., and Zantopp, R. (2006) Variability of the Deep Western Boundary Current east of the Grand Banks. GRL, 33, L21507.

Send, U. et al. (2010) A Global Boundary Current Circulation Observing Network; OceanObs09, CWP

Serra, N., R.H. Käse, A. Köhl, D. Stammer and D. Quadfasel (2010) On the low frequency phase relation between the Denmark Strait and the Faroe Bank Channel overflows. Tellus, 62, doi: 10.1111/j.1600-0870.2010.00445

Voet, G. (2006) Entrainment in the Denmark Strait Overflow Plume by meso-scale Eddies. Diploma Thesis, University of Hamburg, 89 pp.

Voet, G. and D. Quadfasel (2010) Entrainment in the Denmark Strait overflow plume by meso-scale eddies. Ocean Science, 6, 301-310.

09. Names and addresses of scientists of the coastal state in whose waters the proposed cruise takes place with whom previous contact has been made.

Name:	***Dr. Héðinn Valdimarsson***
	Marine Research Institute
Address:	***Skulagata 4***
	121 Reykjavik
	Iceland
Telephone:	***00354 552 0240***
Telefax:	***00354 562 3790***
e-mail:	***hv@havro.is***

10. State:

(a) Whether visits to the ship in port by scientists of the coastal state concerned will be acceptable.
Yes

(b) Whether it will be acceptable to carry on board an observer from the coastal state for any part of the cruise and dates and ports of embarkation / disembarkation.
Yes, after discussion

(c) When research data from intended cruise is likely to be made available to the coastal state and if so by what means.

- *Cruise Report* three months after finishing the research cruise

- ***Scientific publication* within the following three years**

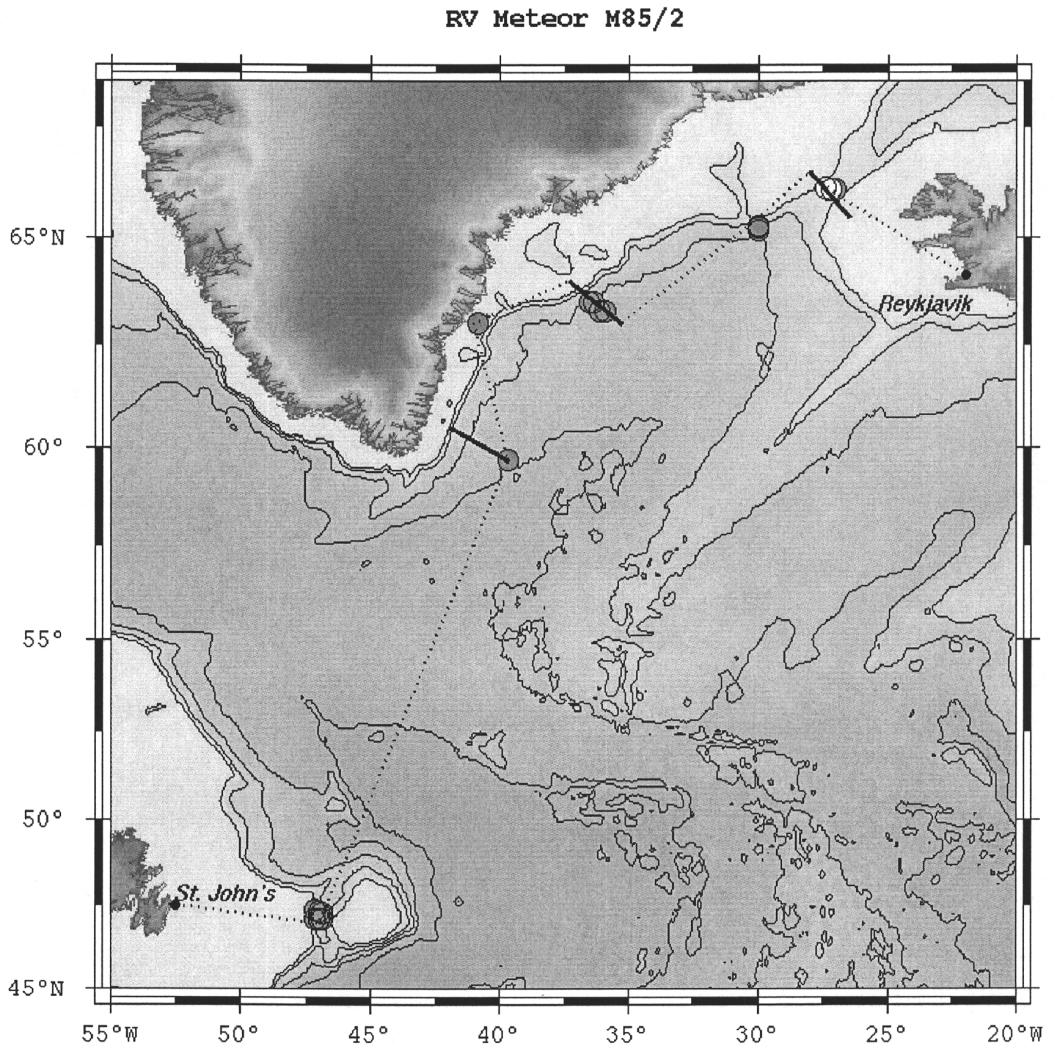
COASTAL STATE: ICELAND

SCIENTIFIC EQUIPMENT

11. Complete the following table - SEPARATE COPY FOR EACH COASTAL STATE

(indicate 'YES' or 'NO')

List of all major Marine Scientific Equipment it is proposed to use and indicate waters in which it will be deployed	Fisheries Research within Fishing Limits	Research concerning Continental Shelf out to Coastal State's Margin	Within 3 NM	Between 3 - 12 NM	Between 12 - 50 NM	Between 50 - 200 NM
a) vessel mounted systems:						
hydroacustic mapping / measuring (incl. ADCP, Parasound and multibeam)	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**
permanent surface water sampling / pumping (incl. Thermosalinograph)	**No**	**No**	**No**	**Yes**	**Yes**	**Yes**
b) mobile equipment :						
CTD with lowered ADCP on all stations	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**
Current meter moorings, for positions see table	**No**	**Yes**	**No**	**Yes**	**Yes**	**Yes**



Planned cruise track of RV METEOR cruise M85/2 from St. John's to Reykjavik, 5. August – 25. August 2011. Red dots indicate mooring positions, yellow dots PIES, the black solid lines CTD/O2/lADCP sections.