

Environment Agency Southern Region

Christmas Floods 1999 Volume One: Performance Review

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Executive Summary

Christmas 1999 saw significant flooding across Southern Region. The current estimate is that between 400-500 properties were flooded by fluvial, coastal and surface water. Over 180 flood warnings were issued with in excess of 72,000 calls being made to the public at risk and organisations during the event.

This review was undertaken to confirm the adequacy of the existing processes and procedures for the delivery of a seamless and integrated forecasting, warning and response service.

To address this issue six activities have been looked at: event management, flood forecasting, flood warning, emergency response, public relations, and health and safety. Within these activities four areas have been reviewed: procedures, systems, liaison, and emergency response roles and responsibilities.

a) Event Management

This exceptional event was well managed. Procedures, systems and liaison arrangements for the event across the Region could be clearer: Roles and Responsibilities need clarifying for events of this nature. This activity is in the process of being addressed through the Changing Needs in Flood Defence Review (CNFDR) due for implementation in September 2000.

b) Flood Forecasting

Overall, procedures and systems worked well during the event and liaison between the Met. Office and the Agency was satisfactory. Emergency response roles and responsibilities were satisfactory. However, there is a clear requirement to improve coastal forecasting and real time monitoring to improve decision making.

c) Flood Warning

Overall, procedures and systems were satisfactory given current arrangements. Indirect warning dissemination via the media received tremendous support from several radio and television channels. Our direct warning service, the Automatic Voice messaging System, handled its largest workload to date. The extent to which these direct and indirect warnings were successful will be determined by Post Event Surveys. Liaison between the Areas and Region was satisfactory. This can be improved and emergency response roles and responsibilities can be made more robust. These arrangements are being strengthened through the CNFDR project.

d) **Emergency Response**

Overall the Agency's response was satisfactory with significant effort made to ensure defences were effective. Procedures and systems were satisfactory for managing flood defences. Arrangements for collecting flood extent data were not satisfactory and are being addressed through the Easter Floods Project. Liaison between the Agency and operational organisations was satisfactory. Emergency roles and responsibilities need to be clarified, and this is being addressed through the CNFDR Project.

e) **Public Relations**

Overall procedures and systems were satisfactory due to the efforts made to liaise with the media. Liaison between Areas and the Region and with operational organisations could be improved. Emergency Response Roles and Responsibilities are clear but need further support during an event.

f) **Health and Safety**

Overall procedures, systems, liaison arrangements were not satisfactory in all cases across the Region. Roles and Responsibilities during an event need clarifying to ensure staff are equipped and prepared for work on site. This applies both to EA Client staff and Emergency Work Force Staff.

Altogether some 43 issues have been identified to improve the six activities listed above. The EFAG and CNFDR projects will address 19 of these, including all of the event management and the majority of the flood warning and emergency response issues.

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List of Abbreviations

ABC	–	Area Base Controller
AFDDO	–	Area Flood Defence Duty Officer
AVM	–	Automatic Voice Messaging
CNFDR	-	Changing Needs in Flood Defence Review
DW	–	Direct Works
DWM	–	Direct Works Manager
EFAG	-	Easter Floods Action Group
EFW	–	Emergency Work Force
FIDO	–	Flood Information Duty Officer
FWDM	–	Flood Warning Duty Manager
MAFF	–	Ministry of Agriculture, Fisheries & Food
MO	–	Met Office
PSTN	–	Public Switch Telephone Network
RBC	–	Regional Base Controller
RCC	–	Regional Communications Centre
RDH	–	Regional Duty Hydrologist
RDO	–	Regional Duty Officer
RGM	–	Regional General Manager
STFS	–	Storm Tide Forecasting Service
TPMR	–	Trunk Private Mobile Radio

1. Introduction

- 1.1 The weather over Christmas 1999 caused significant flooding and disruption across the counties of Hampshire, Isle of Wight, West and East Sussex and Kent as covered by the EA Southern Region. Atlantic low pressure systems bringing bands of very heavy rain on the 24th and heavy rain on the 25th and 26th December, co-inciding with high spring tides led to some 400-500 properties being flooded from coastal, fluvial and tidal waters. Hundreds of other homes were identified for evacuation on Christmas Eve along the Sussex coast. In terms of flood warnings issued to the public this event was the largest direct public warning exercise since the London blitz.
- 1.2 In total some 150 Environment Agency staff were involved over the Christmas period with many giving up time with their families to help ensure that the service was delivered. Staff from 18 standby rotas were involved with others being called out on a 'catch as catch can' basis throughout the event.
- 1.3 From the 24th December until 27th December between 50mm and 80mm fell across the Region. The most intense rainfall fell during the early hours on Christmas Eve in Hampshire; at Romsey 32mm fell in a two hour period with 57mm falling in 18 hours, giving a 1 in 10 year return period for rainfall. On the coast the highest recorded tide since 1924 was recorded in Southampton Water where a predicted tide of 1.96mAOD was exceeded by just under a metre. A level of 2.90mAOD was recorded representing a 1 in 50 year return period. This Region wide coincidence of rainfall and exceptionally high tides clearly represents an extreme event.
- 1.4 The Region issued some 182 flood warnings; 64 coastal and 118 fluvial including 2 coastal red warnings and 12 red fluvial warnings. In total this involved making some 72,000 calls with Automatic Voice Messaging machines, including 63,500 voice calls and 8,500 fax calls.
- 1.5 This event took place against a background of significant planning to ensure continuity of the service through the millennium period, and during the early stages of a national 'flu epidemic.
- 1.6 This performance review seeks to confirm the adequacy of existing processes and procedures for the delivery of a seamless and integrated flood forecasting, warning and response service. The terms of reference are included in Appendix 1.
- 1.7 The Region is heavily engaged in delivering improvements in line with the Easter Floods (EFAG) project and Changing Needs in Flood Defence Review project (CNFDR). This Review will help us to ensure our EFAG and CNFDR activities are robust and will also provide useful event data for several other purposes.
- 1.8 Once this report has been accepted by RMT an Action Plan will be developed, integrated into existing EFAG and CNFDR plans.

- 1.9 The review has been produced following wash up meetings in Kent and Sussex, both on the 6th January and in Hampshire on the 10th January. Regional meetings were held on the 7th January. Reports have also been produced for Kent Area, Appendix 2, Sussex Area, Appendix 3 and Hampshire Area, Appendix 4. Summaries of the Emergency Response are included in Appendix 5. Regional reports have been written by the Regional Duty Hydrologist, Flood Warning Duty Manager and the Regional Emergencies Officer and are included in Appendix 6. Additionally a report by the Storm Tide Forecasting Service has been received and is included in Appendix 7. The Christmas Floods were also discussed at the Regional County Emergency Planning Officer Liaison meeting on the 27th January which has prompted a further issue not previously raised.
- 1.10 Throughout the report where subjective terminology has been used it ranks as follows in assessments made:
1. Outstanding / Excellent
 2. Good / Worked Well
 3. Satisfactory
 4. Not Satisfactory
 5. Unacceptable
- 1.11 The report reviews the following areas with a section on each: event management, flood forecasting, flood warning, emergency response, Public Relations and Health and Safety. Within each section the review considers procedures, systems, liaison and emergency response roles and responsibilities.
- 1.12 A common numbering format for identifying actions has been used as follows with the number of issues shown in brackets:

Activity & Abbreviation	Proc - edures	Systems	Liaison	Emer - gency Response
Event Management (EM)	P (3)	S (1)	L (1)	E (1)
Flood Forecasting (FF)	P (3)	S (4)	L (1)	E (2)
Flood Warning (FW)	P (1)	S (3)	L (2)	E (1)
Emergency Response (ER)	P (2)	S (1)	L (1)	E (1)
Public Relations (PR)	P (2)	S (2)	L (2)	E (1)
Health and Safety (HS)	P (4)	S (2)	L (1)	E (1)

2. Event Management

2.1 Summary

- 2.1.1 The weather services provided by the Met Office gave indications during the week commencing 20th December that there may be storms over Christmas. This prompted a letter to the local authorities in Sussex and increasing PR activity as the week progressed. Altogether the Region has 18 standby rotas for staff involved in the flood forecasting, warning and response service to ensure events can be identified early and managed for their duration. Staff on these rotas opened Area and Regional Incident Rooms as follows:

Sussex AIR 09.30 on 24th December

Regional Incident Room – 17.00hrs on 24th December

Hampshire AIR 18.30 on 24th December

Kent AIR – 21.00hrs on 24th December

- 2.1.2 During the event staff on rotas, but not on standby, were brought in on a 'catch as catch can' basis so that around 150 people in total were involved across the Region. This figure shows the dedication of staff to this activity, given the Christmas period and 'flu epidemic.
- 2.1.3 During the event, liaison took place several times a day between the Met Office in Southampton and the Regional Duty Hydrologists, and between Area Flood Defence staff and the Storm Tide Forecasting Service, on specific coastal issues.
- 2.1.4 Representatives from Sussex Police Force and East Sussex Fire Service Brigade attended the Area Incident Room in Saxon House and the Agency's Direct Works Manager attended the Gold Control Room at Sussex Police Headquarters in Lewes. This representation allowed excellent communication during the event and has been praised by Nigel Yeo, Assistant Chief Constable, Sussex Police (letter dated 30 December).

"I was particularly, and perhaps unusually, pleased to be able to feel that in all honesty we could have done no more than we did between us to prepare for what might have happened. Perhaps it was our level of preparation that induced the elements to smile on us at the last minute!"

- 2.1.5 Additional liaison took place between the EA and local authorities and County Emergency Planning Officers across the Region and were generally satisfactory. However, there are a small number of situations where their out of hours arrangements were not satisfactory.

- 2.1.6 Internally, liaison took place between the Areas, Region and National Head Office through Help Reports and Sitreps produced between 24th December and 30th December 1999.

Key Successes: *The commitment and support of staff during the Christmas Period and the Joint representation of the Police and Fire Brigade in the Sussex incident Room and EA at Gold Control for Sussex Police in Lewes.*

2.2 Outline of Arrangements

Southern Region has staff on some 18 rotas to ensure the Flood Forecasting, Warning and Response service can be delivered. Staff on these rotas are responsible for dealing with events and manning up incident Rooms and for ensuring other staff are brought in to deal with the event as necessary.

2.3 Procedures

- 2.3.1 The Regional Incident Procedures (RIPS) (dated 20th June 1999) guide how the Agency will manage events, including flooding and flood warning. Section 3 sets out the role of the Regional Office as including the following roles and used during the event as follows:

Regional Duty Officer - Used
Regional Base Controller - Used
Regional Emergencies Officer – Not used
RCC Co-Ordinator - Used
Regional Incident Room Manager - Used
Regional Incident Room Support Staff - Used
PR Duty Officer - Used

- 2.3.2 Section 4 of the RIPS sets out the role of the Area Office as including the following roles and used during the event as follows:

Base Controller - Used in all Areas
Site Controller – Used in all Areas
Flood Defence Officer – Used in all Areas
Liaison Officer (Internal) – Not used in Hampshire Area
Liaison Officer (External) – Used in Sussex Area

- 2.3.3 At regional level only the RDO role has a list of nominees before an event takes place. There is a need to identify and train those regional function managers who could be expected to assume the RBC role in such circumstances, along with supporting staff. (Key Issue EM/P/1).

- 2.3.4 An important part of the RIPS is to guide the opening and management of a regional incident room. Overall this worked but the procedures do not deal with the Regional Incident Room and its interface with the RCC. During the event

many staff from the RIR found it necessary to get updates directly from the RCC, causing some disruption to staff working there. There is a need to review the links between the RCC and RIR and the roles they undertake. (Key Issue EMP/P/2).

2.3.5 Incident rooms were opened as follows across the Region.

Sussex AIR 09.30 on 24th December
Regional Incident Room – 17.00hrs on 24th December
Hampshire AIR 18.30 on 24th December
Kent AIR – 21.00hrs on 24th December

2.3.6 Overall across the Region the arrangements for opening were satisfactory. Improvements should be made to clarify the conditions for opening. Notification of when rooms were open and closed could also be improved. (Key Issue EM/P/3).

2.4 Systems

2.4.1 The main system for managing information about an event across the region is through the HELP and Sitrep procedures. Information is collated in a variety of formats (mainly verbal, hand written, faxed and emailed) and includes a variety of details.

2.4.2 During the event a number of systems were used to communicate between internal and external parties:

Verbal updates
PSTNs
Mobile Phones
TPMR
Pagers
Faxes
Email

2.4.3 Overall the arrangements for informing others of telephone and fax numbers within the event were not satisfactory and could have been made easier. A Regional/National Flood Room Directory with wide electronic access has been suggested (Key Issue EM/S/2).

2.5 Liaison

2.5.1 The main formal requirement for internal liaison during an event is between the Areas, the Region Office and Head Office. These arrangements are largely guided by the Regional Incident Procedures and also Head Office Liaison Procedures dated June 1999 (EAP/OP/EM/001/Version 3.1/June 1999).

- 2.5.2 These procedures were not followed during the event following an instruction from Head Office that a revised procedure, with a new template, was to be used from 14.01 on the 24th December. The Region was asked to complete Regional Flooding Summary Reports, not Sitreps, at 11.00 hrs each day. It was not clear if this was in addition to or replaced requirement for Sitreps.
- 2.5.3 The system is not helped by the general level of understanding of the HELP and Sitrep procedures within the Region and at Head Office. The procedures for the format, timing and content of HELP and Sitrep reports needs clarifying (Key Issue EM/L/1) so that there is one reporting format to prevent confusion and delays.
- 2.5.4 Reports were produced as follows. Overall the arrangements for liaison regarding event management were not satisfactory due to the poor general level of awareness of the procedures throughout the Agency.

HELP and Sitreps Produced					
Date:	National Sitreps	Regional Sitreps	Hampshire	Sussex	Kent
December 24 th	14.01 Sitreps requested;	17.55	VERBAL	VERBAL	VERBAL
25 th	12.00	08.00 11.00 13.30	VERBAL	02.42	03.45 HELP 12.30 HELP
26 th	11.30	14.00	VERBAL	VERBAL	VERBAL
27 th	11.00	AM	06.30	11.00	10.00 16.00 HELP
28 th	11.00				
29 th	11.00				
30 th	11.00				

2.6 Emergency Response Roles and Responsibilities

- 2.6.1 The RDO is a standby post and during the early stages of the event, the Duty RDO was replaced by the Water Manager so that there was clear functional lead and involvement, in line with the RIPs. The RDO briefed the RGM and MAFF during the event as the situation dictated rather than at fixed times. The procedures do not define an emergency response role for the RGM.
- 2.6.2 The RBC role is not a standby role and was filled on a catch as catch can basis by the acting FD manager.
- 2.6.3 The ABC role is not a standby role and was filled by Area FD DO in Hampshire and FD Co-ordinators in Sussex and Kent.

2.6.4 Overall arrangements were satisfactory during the event but clear lines of responsibility need to be developed. These are being developed via the CNFDR project for implementation by September 2000 (Key Issue EM/E/1).

2.7 Key Issues & Actions

EM/P/1- Emergency Roles

Issue - Emergency roles are identified in RIPs and staff need to be assigned and trained to fill these roles.

Action - Identify posts/staff to fill emergency roles; in hand via the CNFDR project.

Responsibility - Regional Engineer (Flood Warning and Regulation)

EM/P/2 - Location of the RCC and RIR

Issue - The location of the RIR and its proximity to the RCC needs reviewing to help improve communications.

Action - Review RCC and RIR location and activities. To be resolved during the Regional Office accommodation review.

Responsibility - Water Manager

EM/P/3 Opening Area and Regional Incident Rooms

Issue - The conditions for the opening and closing AIRs together with appropriate notifications need reviewing.

Action - Review RIPs and Area Flood Defence Procedures; in hand via CNFDR project.

Responsibility - Regional Engineer (Flood Warning and Regulation)

EM/S/1 Incident Room Contact Numbers

Issue - Communications between Area and Regional Incident Rooms are hampered through lack of up-to-date contact numbers.

Action Update and distribute Area and Regional Telephone/fax numbers; to be addressed via EFAG.

Responsibility - Regional Engineer (Flood Warning and Regulation).

EM/L/1 Help and Sitrep Procedures

Issue - HELP and Sitrep procedures need clarifying, particularly the timing and content of reports.

Action - Clarification of Incident Procedures; in hand via the CNFDR project for September 2000.

Responsibility - Regional Engineer (Flood Warning & Regulation)

EM/E/1 Lines of Responsibility

Issue - Management lines of responsibility during events are not clear.

Action - Review Regional Incident Procedures and Area Flood Defence Procedures; in hand via the CNFDR project for September 2000.

Responsibility - Regional Flood Defence Manager

3. Flood Forecasting

3.1 Summary

3.1.1 The Region receives a five day forecast from the Met Office every day. Additional ten day forecasts were being provided from the Met Office for the Millennium period and five day coastal forecasts were being provided from the Storm Tide Forecasting Service.

3.1.2 The five day forecasts indicated at the start of the week commencing 20th December that there would be gale force winds over Christmas and internal and external liaison took place because of these. Confirmation of coastal forecasts were sought from the Storm Tide Forecasting Service and this liaison increased confidence in the warnings issued. The Key Issue for coastal forecasting is the lack of real time information and near-shore wave information which limited monitoring of the event.

3.1.3 The very high rainfall amounts were not forecast until the morning of the 24th, being identified as moderate the previous day. The Regional Duty Hydrologist was alerted early on the 24th by the issue of a Heavy Rainfall Warning, and from that point on the Hydrologists were involved in significant liaison with Area and Regional staff providing support in running flood forecasting models and forecasting flows from rainfall. The Key Issue for fluvial forecasting is the level of support that this regional rota can provide Area staff; other Water resources staff were brought into Area Incident Rooms as were other staff on the rota.

Key Success: Liaison between the Agency and Met Office, and the Storm Tide Forecasting Service, supporting decision making for flood warnings issued.

3.2 Outline of Arrangements

3.2.1 Southern Region receives its weather services from the Met Office at Southampton with additional coastal information from the Storm Tide Forecasting Service at Bracknell. The service from Southampton includes a daily five day forecast at 05.00hrs each day together with gale warnings and heavy rainfall warnings whose criteria are determined by the Region. Severe Weather Warnings are also received from Bracknell.

3.2.2 For coastal forecasting, information is usually received in the RCC from the Storm Tide Forecasting Service once a day and twice a day during spring tide periods. This consists of surge height information; wave height, period and direction; and wind speeds and direction from the Continental Shelf Model, which is run at 00.00hrs and 12.00hrs. Once received in the RCC it is related to

predicted tide information to calculate whether operational or flood warning thresholds have been exceeded. If so, then the Area FD DO is informed. Regardless of the level, the information received is also faxed through to each Area.

3.2.3 For fluvial forecasting the Region relies on three main elements: Heavy Rainfall Warnings and the Hyrad radar display system to identify rainfall and the Regional Telemetry System to record rainfall and river flows and levels. Fluvial flood forecasting is primarily done on a trigger level principle, as interpreted by AFDDOs as fluvial models are being developed to be run by the Regional Duty Hydrologists

3.3 Procedures

3.3.1 Flood forecasting is guided by the Regional Flood Forecasting Procedures (dated 11th February 1999) which primarily guide coastal forecasting; Regional Duty Hydrologist procedures (dated 10th June 1998) and the three Area FD DO procedures (Kent dated 30th September 1999; Sussex dated 15th November 1999; and Hampshire dated 17th December 1999).

3.3.2 Overall the procedures worked well during the event for coastal forecasting. However, communicating and processing STFS information is currently a manual process subject to human error when calculations are made and is also time consuming. The STFS did not always pass on the 12.00 output from their model in the afternoon, requiring action from the RCC (Key Issue FF/P/1). Additionally the Alerts issued for reference ports can cause confusion for RCC and Area staff as the procedures are not clear on this area. (Key Issue FF/P/2).

3.3.3 Overall the procedures worked well; their ease of use would be improved if the two regional procedures were written as one document. (Key Issue FF/P/3).

3.4 Systems

3.4.1 The region has recently introduced its Regional Telemetry System to replace an older non Y2K compliant system and to improve the speed and accuracy of the information received from catchments and the coast. Overall the system worked well and staff were happy with its performance but have suggested some improvements to the presentation and updating of data (Key Issue FF/S/1).

3.4.2 The Hyrad weather radar display system worked well but is subject to some long term minor glitches that were disrupting for staff during the event (Key Issue FF/S/2). No problems have been reported with access to Hyrad servers and the laptops worked well.

3.4.3 Both of these systems can be mounted on one PC in an incident Room but during a large event there is a need to have dedicated PCs for each system (Key Issue FF/S/3).

3.4.4 The RTS system needs to be enhanced to allow the display of real time coastal information, particularly inshore wave height and directions (Key Issue FF/S/4) to enhance our decision making ability for warning and emergency responses.

3.5 Liaison

3.5.1 During the event there was good liaison between the Met Office and RDH and Area Incident Rooms. Over the course of the event the RDH spoke to Southampton MO on xx occasions, in addition there were phone calls between the Area Incident Rooms staff and the STFS. Liaison between the RDH and Area staff was also good with many FD staff commenting on the usefulness of the RD hydrologists and their support in running existing fluvial models. The lack of a regional focus for coastal forecasting has been raised as a concern and whether this role can be incorporated into the RDH responsibilities needs investigating (Key Issue FF/L/1) in line with the CNFDR project.

3.6 Emergency Response Roles and Responsibilities

3.6.1 The Regional Duty Hydrologist is the focus for Flood Forecasting within the region and there are a number of issues affecting this role:

- the scale of a regional event is too large for one person to deal with;
- the number of models the RDH is expected to run will increase;
- the requirement for the RDH rota to include coastal forecasting has been raised, particularly given the number of properties flooded on the coastal/fluvial interface.

3.6.2 As with all rotas during an event staff not on standby may be called out to assist on a 'catch as catch can' basis. This arrangement did not work well for the RDH rota with only one other member being available from eight on the rota in total. This led to a few members of the team having to do long shifts (i.e. >8 hours). As the RDH role expands there is a need to consider how best to provide staff to provide this service (Key Issue FF/E/1).

3.6.3 Line management for the RDH during an event is not clear and needs to be reviewed (Key issue FF/E/2).

3.7 Key Issues & Actions

FF/P/1 Receipt of STFS Information

Issue - Surge Model output is not always received on time.

Action - Contact STFS to clarify timing and delivery of Surge Model output.

Responsibility - Regional Engineer (Flood Warning & Regulation).

FF/P/2 Procedures for Handling STFS Alerts

Issue - Revised information received outside of normal STFS model outputs needs incorporating into procedures.

Action - Review STFS Alert procedures in Regional Flood Forecasting procedures.

Responsibility - Regional Engineer (Flood Warning & Regulation).

FF/P/3 Integrate Forecasting Procedures

Issue - Regional Forecasting procedures are currently separate from Duty Hydrologist procedures.

Action - Incorporate RDH procedures into RFFPs.

Responsibility - Regional Engineer (Flood Warning & Regulation).

FF/S/1 RTS Improvements

Issue - The RTS displays historic polled values against new alarms.

Action - Improve display of alarms.

Responsibility - Regional Flood Forecasting Officer

FF/S/2 HYRAD Display

Issue - The HYRAD system suffers from problems in resizing data within display screens.

Action - Liaise with software suppliers.

Responsibility - Regional Flood Forecasting Officer

FF/S/3 RTS and HYRAD Hardware

Issue - Both RTS and Hyrad are mounted on the same PC but during a large event separate PCs are required.

Action - Review requirements for AIRs.

Responsibility - Area Flood Defence Managers

FF/S/4 Develop RTS for Coastal Forecasting

Issue - Real time coastal information is lacking.

Action - Improve coastal information on RTS through real time wave and wind monitoring.

Responsibility - Regional Engineer (Flood Warning & Regulation).

FF/L/1 Regional Coastal Forecasting Role

Issue - There is no regional focus for coastal forecasting.

Action - Review RDH role in coastal forecasting; in hand via CNFDR project for September 2000 implementation.

Responsibility - Regional Engineer (Flood Warning & Regulation).

FF/E/1 Staffing of RDH Rota

Issue - RDH role is expanding and requires additional staff to manage workload.

Action - Review current staffing arrangements; in hand via CNFDR project for September 2000 implementation.

Responsibility - Regional Flood Forecasting Officer

FF/E/2 Line Management of RDH During Event

Issue - Line Management of the RDH during events is not clear.

Action - Clarify line management responsibility for RDH during event; in hand via CNFDR project for September 2000 implementation.

Responsibility - Regional Flood Defence Manager

4. Flood Warning Dissemination

4.1 Summary

4.1.1 Between the 22nd December, the start of the spring tide period and the 28th December when warnings were stood down, the Region issued some 182 flood warnings; 64 coastal and 118 fluvial including 2 coastal red warnings and 12 red fluvial warnings.

	Coastal	Fluvial	Total
Yellow	27	57	84
Amber	35	49	84
Red	2	12	14
Totals	64	118	182

4.1.2 In total this involved making some 72,000 calls with Automatic Voice Messaging machines, including 63,500 voice calls and 8,500 fax calls. However of these only some 30k voice calls were answered and 5,200 fax calls were answered.

4.1.3 Overall the AVM machines did not perform as well as anticipated when compared with testing undertaken in November 1999. This is due to the current call making capacity of the system which falls short of the regional requirements for flood warning dissemination. During the event this led to the Surefax back up system being used to ensure flood warning faxes were delivered.

4.1.4 Calls from the public, routed through Option 2 of the Floodline system caused significant work in the RCC due to the volume of calls received and the fact that all phones were receiving Floodline calls, as opposed to one dedicated line.

4.1.5 Nationally during the event Floodline received 30,000 public calls; 15,693 were on 24th December alone. Of these some 11,103 callers made use of the Recorded Message System information (Option 1). Within the RCC 1200 calls were taken from the public on the 24th with a peak rate of 110 per hour. The majority of these (80%) were passed through to AIRs to deal with.

Key Success: Managing and operating the AVM and Floodline Recorded Message Systems to deliver Flood Warnings and ensuring people tuned into radio and TV for further information.

4.2 Outline of Arrangements

4.2.1 The flood warning dissemination service comprises two key elements – a direct warning system and several broadcast systems to ensure that the public are warned of the flood risk and can find out further information.

4.2.2 The main method of delivering direct warnings is via the two regional Automatic Voice Messaging machines with a limited reliance on loudhailer systems. The main methods of indirect warnings include the media (local radio and television) weather forecasts, travel bulletins, Teletext and Floodline. The combined success of the direct and indirect methods will be assessed via the Post Event Surveys and chosen from suitable sites listed in the Area reports (Appendices 2, 3 & 4).

4.2.3 Flood Information Duty Officers (FIDOs) are responsible for flood warning dissemination during an event and for updating the Floodline Recorded Message Service (RMS). A Flood Warning Duty Manager (FWDM) supports this work and ensures adequate staffing and the continuity of the service.

4.2.4 Flood Warning Dissemination is undertaken in the RCC in Worthing and remotely with the Winchester AVM system.

4.3 Procedures

4.3.1 The Regional Flood Warning Dissemination Procedures (dated 1st September 1999) guide dissemination work undertaken by RCC staff, FIDOs and the FWDM.

4.3.2 Overall the FIDO team and FWDM felt these procedures worked well and all staff had received recent training. The procedures were less clear on how to stand down and downgrade flood warnings during the close down of the event. The procedures do not specifically include advice on how to operate the system remotely or set up a back up system at another AVM site. (Key Issue FW/P/1).

4.4 Systems

4.4.1 Each AVM machine has 30 voice lines and 6 fax lines plus one pager line. Purchased in 1996 the system was originally designed to be used one machine at a time with one as a back up. Since 1996 the public database has increased from 600 to some 30,000 at the time of the event. This has necessitated the use of the machines in parallel with no other backup. The RCC is however equipped with Surefax which can be used to issue faxes but not voice calls. Procedures are in place to use loudhailers to supplement red coastal warnings but not to back up the AVM in a failure across coastal and fluvial flood warning zones.

4.4.2 Overall the AVM machines did not perform as expected in comparison with testing undertaken in November 1999 and fall short of the regional requirements for flood warning dissemination, due to the current call making capacity of the system. The clearest example of this is the red warning issued for the West Sussex coastline on the 24th December took 8hours 10 minutes to complete dissemination, and completely tied up one AVM for this period. With the regional system 8 flood warnings for the same Area were issued during this period from the other AVM machine. (Key Issue FW/S/1). Additionally, the

interface between the fax templates and the AVM system can result in errors affecting the meaning and numbering of the faxes issued and can slow down dissemination time. (Key Issue FW/S/2).

4.4.3 The Floodline service provides the latest flood warnings in force (Option 1) and incident reporting facilities (Option 2) 24 hours a day 365 days a year. Additional operators are provided during normal business working hours (Option 4). Nationally during the event Floodline received 30,000 calls from members of the public; 15,693 were on the 24th December alone. Of these some 11,103 callers made use of the RMS information (Option 1). Within the RCC 1200 calls were taken from the public on the 24th with a peak rate of 110 per hour. The majority of these (80%) were passed through to AIRs to deal with.

4.4.4 Overall the Floodline system worked as expected, with the public being routed through to the region to report flooding incidents. However the volume of calls and their nature – i.e. not all were reports of flooding but further information requests on warnings issued – posed problems for the RCC and Areas. Additionally calls from Floodline were routed through to all phones in the RCC meaning that other priority calls could not be taken from Agency staff and emergency services. (Key Issue FW/S/3).

4.5 Liaison

4.5.1 Clear internal liaison is required from the Areas, with responsibility for decision making, through the RCC to the FIDO and FWDM team. The FWDM is responsible for updating the Regional Base Controller and Public Relations, primarily with flood warnings in force and developing situations and concerns.

4.5.2 Overall, liaison between the above groups was good. However the scale of the event made it difficult to formally record all requests for flood warnings and keep track of the warnings in force. (Key Issue FW/L/1). Additionally, improved liaison between the Areas and FIDOs would improve the quality of information in the RMS messages. (Key Issue FW/L/2).

4.6 Emergency Roles & Responsibilities

4.6.1 The FIDO team includes five staff, one of who is on standby at any one time. During the event four of the five staff were involved. The FW Duty Manager team comprises two staff, one of who is on standby at any one time. Both FWDMs were involved over the course of the event. There is not currently an RCC Co-Ordinator rota and this role was filled by the REO who is not on standby.

4.6.2 Overall the arrangements were unacceptable as people were required to work long shifts. There is a need to review the arrangements for staffing the FIDO, FWDM and RCC Co-ordinator roles. (Key Issue FWD/E/1).

4.7 Key Issues & Actions

FW/P/1 – Flood Warning Dissemination Procedures

Issue - Standdown and downgrade procedures are not clear remote operation of AVMs needs documenting.

Action - Review & update Flood Warning Dissemination Procedures to ensure standdown arrangements and operation of remote AVMs are clear. New warning codes will also clarify arrangements via the EFAG project.

Responsibility - Regional Engineer (Flood Warning and Regulation).

FW/S/1 – AVM Call Capacity

Issue - In total the AVM systems made a large number of calls (72,000) but there is no doubt that these could have been made more quickly. The existing system was slowed down with the large number of retries required at Christmas time and through the call logs building up and slowing the system down. The working call rate was around 900 / hour with one minute messages as opposed to 1500 calls/hour established during testing in November, and this operational rate should be used for planning future requirements.

Action - Increase call making capacity within the Region and pursue inter-Regional back up arrangements; in hand via CNFDR project for September 2000 implementation.

Responsibility – Regional Engineer (Flood Warning and Regulation).

FW/S/2 – Fax Message Preparation

Issue - All voice messages for flood warnings and standdowns are prerecorded and allowed all warnings to be issued with the appropriate messages. Fax messages are held as Word templates and updated in real time. This process is complex and requires significant training for staff. Even with this, the process is prone to minor errors affecting the meaning of the fax and the numbering of messages, and can result in old warnings being re-issued.

Action – Develop integrated fax preparation system as part of the AVM system.

Responsibility – Regional Engineer (Flood Warning and Regulation).

FW/S/3 – Public calls

Issue - The volume of public calls received by the Agency through the Floodline service is unprecedented and had a significant impact at all levels of operation. Additionally the way calls were routed into the region from Floodline caused problems for Agency staff and emergency services trying to contact the RCC. At the height of the event two staff in the RCC were solely answering calls; two in Hampshire; three in Sussex and five in Kent.

Action - a) review phone call handling requirements; b) provide clear call routing and c) review staffing arrangements to deal with all calls. These actions need to be incorporated into the Floodline 12 month review.

Responsibility – Regional Engineer (Flood Warning and Regulation).

FW/L/1 – Flood Warnings in Force

Issue - There is no formal process for flood warnings to be logged in the Areas, passed through to the RCC and onto the FIDOs. The FIDOs have a formal log sheet to keep updated, but numbering errors occurred when two AVM sites were operated. There are currently five methods of recording flood warnings in force in the RCC alone.

Action - Develop one regional system for keeping track of warnings in force and identify responsibility for updating this system.

Responsibility – Regional Engineer (Flood Warning and Regulation).

FW/L/2 – Floodline RMS Scripts

Issue - The information for Floodline RMS messages is all pre-scripted and could be improved with real time information from the Areas through to the FIDOs.

Action - Develop system to enable updated information to be passed through from Areas to FIDOs.

Responsibility – Regional Engineer (Flood Warning and Regulation).

FW/E/1 – FW Emergency Staffing Levels

Issue - There are currently only five members of staff on the FIDO rota, two on the FWDM rota and none on the RCC Co-ordinator rota. Additional staff are required to support over an event and the possibility of dividing workloads should be considered.

Action - Recruit more staff onto FIDO and FWDM rota and review requirement for RCC Co-ordinator rota; this action will modify in line with the CNFDR project for implementation in September 2000.

Responsibility – Regional Engineer (Flood Warning and Regulation).

5. Emergency Response

5.1 Summary

5.1.1 Emergency Response includes that undertaken by the Agency through the Emergency Work Force and also by the emergency services and local authorities.

5.1.2 The Agency's response arrangements are described in Area Flood Defence Procedures along with instructions for flood patrols and site inspections. Arrangements for other organisations tend to be undertaken in line with generic response plans. There are examples of specific response plans drafted to deal with flood events and these allowed for an improved response from the Agency and partner organisations.

Key Success: The commitment and work undertaken by the Emergency Workforce over the Christmas period and the joint response undertaken with New Forest District Council and East Sussex County Council.

5.1.3 In total 17 of the 21 coastal zones and 21 of the 24 catchments had warnings in force, during the event. Flooding incidents were reported at 58 sites across the Region with between 400-500 properties affected.

5.1.4 Agency staff were involved in responding to flooding at 30 sites with emergency services and local authorities responding jointly and separately at these and other sites.

5.2 Outline of Arrangements

5.2.1 The Agency operates flood defences to ensure that they will perform as planned under flood conditions to minimise the risk of flood damage. The Emergency Work Force (EWF) is used to respond on site as directed by Flood Defence Teams in the Areas. The current size of the EWF within Southern is 224 with 1700 Nationally.

5.2.2 With Southern Region the EWF is divided into two teams, one covering Kent and one covering Hampshire and Sussex Areas.

5.3 Procedures

5.3.1 Area Flood Defence Teams manage flood defences in line with Area Flood Defence Procedures and specific operating procedures for larger sites, e.g. the Dartford Barrier Procedures. They direct EWF Teams to areas that are at risk or have been flooded to manage Agency flood defences and assist other authorities when this resource permits. Overall these arrangements were satisfactory.

5.3.2 Area Flood Defence Procedures also include arrangements for flood patrols and inspection teams. Overall arrangements were not satisfactory with wide variation in the information provided to teams and difficulty in staffing all of the necessary site visits required. A review of these arrangements is required (Key Issue ER/P/1).

5.3.3 The response of emergency services and local authorities varies across the Region and there are no agreed standards. The joint response has worked well where response plans have been drafted before flooding, particularly by New Forest District Council and East Sussex County Council for Pevensey Bay. There is a need to ensure that response plans are in place (Key Issue EP/P/2) for high risk sites in line with the Flood Warning Service Strategy.

5.4 Systems

5.4.1 Reports of flooding received from the public and emergency services and local authorities are directed through the RCC and routed through to the Area Flood Defence Teams to co-ordinate.

5.4.2 These reports are sent verbally or faxed. There is no automated system to manage the receipt, storage and resolution of flood reports received. Overall, the system was satisfactory but could be improved. (Key Issue ER/S/1).

5.4.3 Additional information from the EWF and other FD staff out on site can be fed back to Area Incident Rooms and gathered by the Area Base Controller. There is no standard method of recording this information. A data collection handbook is awaited through the EFAG project which will improve the arrangements. (See Key Issue ER/P/1).

5.5 Liaison

5.5.1 The main communications routes to ensure the emergency response is effective are from the public and emergency services through to the RCC and onto the Areas, and between the Areas and EWF.

5.5.2 There are several examples where, because of the volume and routing of Floodline calls, emergency services could not contact the RCC to report incidents. This issue has previously been raised. (Key Issue FW/S/3).

5.5.3 Liaison between the Area Base Controller and EWF Controller was satisfactory in most cases, working most effectively where the EWF controller was present in an Area Incident Room. (Key Issue ER/L/1).

5.6 Emergency Response Roles and Responsibilities

5.6.1 Area Base Controllers are responsible for co-ordinating the EWF efforts and these arrangements worked well.

5.6.2 The Direct Works Manager, acting as External Liaison Officer at Sussex Police Gold Control, liaised directly with the Sussex Area Base Controller which played a significant part in ensuring an integrated response for areas at risk of coastal flooding in Sussex.

5.6.3 Elsewhere communications varied between the Agency and emergency services and local authorities for a number of reasons. While the scale of the event varied across the Region a designated liaison officer to co-ordinate communications with partner organisations would improve the joint response. (Key Issue ER/E/1).

5.7 Key Issues and Actions

ER/P/1 Flood Event Data Collection

Issue - Arrangements for staffing and collecting data are inconsistent across the Region.

Action - Introduce National data collection handbook; this is in hand via the EFAG project.

Responsibility – Area Flood Defence Managers

ER/P/2 Local Authority Response Plans

Issue - Need to develop site specific response plans to improve joint response to flooding.

Action - Support and develop plans through Flood Warning Planning Groups ensuring appropriate links to EFAG and MAFF High Level Target (3).

Responsibility – Area Flood Defence Managers

ER/S/1 Managing Flood Incident Reports form the Public

Issue - There is no regional or national system in place to manage incident reports.

Action - Review national position and implement system.

Responsibility – Regional Engineer (Flood Warning & Regulation).

ER/L/1 Liaison with Emergency Work Force

Issue - Arrangements for EWF Managers/Liaison Officers within incident rooms need to be included with area FD procedures to improve liaison.

Action - Update Area FD procedures; in hand via CNFDR project for implementation in September 2000.

Responsibility - Area Flood Defence Managers

ER/E/1 Designated Liaison Officers

Issue - A designated liaison officer with responsibility for communicating with local authorities and Emergency Services needs to be present in Area Incident Rooms, moving to Silver or Gold control when necessary.

Action - Update Area FD procedures; in hand via CNFDR project for implementation in September 2000.

Responsibility - Area Flood Defence Managers

6. Public Relations

6.1 Summary

6.1.1 Southern Region has an annual programme of flood warning awareness work and undertakes significant amounts of PR work leading up to and during flood events. Direct mailing of information was undertaken in 1999 to 200k properties known to be at risk of flooding, and has previously been undertaken in 1998, 1997 and 1996. These mailings have seen the number of recipients on the AVM system rise from 600 in 1996 to 30,000 at the time of the event, significantly raising awareness of flooding issues.

6.1.2 The first press release warning of increased flood risk over Christmas was issued on the 20th December with a further six being issued up to the 29th December. The Press Office alone handled 500 calls from the media, with EA staff giving 80 local and national radio interviews. The Region's efforts received 10 mentions in National newspapers and dozens of local items. On Christmas Eve the event was the top story on BBC and ITN national news with staff giving interviews to BBC 1, Sky TV and ITN and BBC News 24 as well as local BBC TV and Meridian TV. The event was also the top story on the BBC Online Web page. During Christmas Eve evening staff gave interviews to over 20 radio stations including BBC Radio 4, 6 o'clock news, Radio 5 live and LBC. As high tide on the 24th approached at midnight staff were giving interviews every 20 minutes to local BBC radio across Southern England, ensuring those at risk had the latest information. Radio and TV coverage continued until Wednesday 29th December including reports on national TV on Christmas Day and Boxing Day and on local BBC TV of the Chief Executives visit to Selsey on the 28th.

Key Success: This event had the highest level of media coverage, with national and local TV and Radio providing the latest information on a rapidly changing situation, from dozens of staff across the region.

6.2 Outline of Arrangements

6.2.1 The regional PR section has a weekly standby rota to cover out of hours events that may generate media interest. The key aspects are ensuring information is provided from the Agency to local TV, radio and newspapers so that the public can receive information and advice from the Agency.

6.3 Procedures

6.3.1 Staff on the PR standby rota rely on media contact details to be able to operate. These are currently kept up to date manually but there is a long running request for CIS to provide 'Media Disc' which includes all national and local media numbers (Key Issue PR/P/1).

6.3.2 There needs to be a clear focus for these PR enquiry's in the Areas and Region and this worked well during the event where an incident room was set up. There is a need to review procedures for opening incident rooms not only to deal with the technical management of a flood event but also the public relations aspects (Key Issue PR/P/2).

6.3.3 Overall, the arrangements worked well.

6.4 Systems

6.4.1 Southern Region currently has three ISDN lines; one each in Guildbourne House, Saxon House and West Malling. These greatly improve the quality of communications between the Agency and media. An ISDN link is required in Hampshire (Key Issue PR/S/1).

6.4.2 PR also rely on pagers and fax machines for communications. A dedicated pager for PR is being pursued to allow receipt of flood warnings directly. Problems with fax machines were experienced particularly running out of consumables, exacerbated by the plethora of different fax machines in use across the Agency (Key Issue PR/S/2).

6.5 Liaison

6.5.1 Wherever requests for media interviews are received they should be directed through the PR Office, and there is evidence that this worked well – even when bulldozer drivers were asked for interviews at Selsey. In total some 500 requests for interviews were received and satisfied during the event.

6.5.2 Seven Press Releases were issued as follows:

20th December 1999
23rd December 1999 @ 17.00hrs
24th December 1999 @ 11.00am
25th December 1999 @ 11.00am
26th December 1999 @ 11.00am
27th December 1999 @ 10.00am
28th December 1999

6.5.3 The early release of the press releases has caused some public concern of the Agency's performance given our early knowledge of the event (Key Issue PR/L/1).

6.5.4 Additionally following discussions with County Emergency Planning Officers there was not sufficient liaison between the PR Office and that of other external PR departments. Arrangements should be reviewed to ensure that the Press Releases reflect the needs of all operating organisations as far as possible (Key issue PR/L/2).

6.6 Emergency Response Roles and Responsibilities

6.6.1 The Duty PR Rota currently has only two staff on standby in total and this led to other staff not on standby, but with PR experience, being brought in to deal with the event. At one stage the Sussex ABC took on responsibility for the Duty PR role to allow staff to rest. (Key Issue PR/E/1).

6.7 Key Issues & Actions

PA/P/1 Provision of Media Disc

Issue - Contact details are manually updated at present prejudicing effective liaison with the media.

Action - Arrange for installation at necessary sites.

Responsibility - Public Relations Manager

PA/P/2 Opening of Incident Rooms

Issue - Effective PR is possible only with good communications, best provided from Area Incident Rooms.

Action - Review opening of AIRs to include PR requirements; in hand via CNFDR project for implementation in September 2000.

Responsibility - Area Flood Defence Managers

PA/S/1 ISDN Lines

Issue - ISDN lines allow effective communication between Agency and Media and are not available at one Area Office.

Action - Arrange for ISDN link at Colden Common.

Responsibility - Public Relations Manager

PA/S/2 Standard Fax Machines

Issue - There is a wide variety of fax machines across the Region causing problems for staff in operating equipment.

Action - Standardise equipment and maintenance contracts.

Responsibility - Regional Flood Defence Manager

PA/L/1 Timing of Press Releases

Issue - The issuing of the Press Releases in the lead up to flood events needs to reflect the Agency Response during the event..

Action - Review policy for issuing flood warning press releases.

Responsibility - Public Relations Manager

PA/L/2 Liaison on content of Press Releases

Issue - There needs to be discussion on the content of press releases between the Agency, Emergency Services and Local Authorities during significant events.

Action - Review liaison arrangements.

Responsibility - Public Relations Manager

PA/E/1 Staffing of PR Duty Rota

Issue - There are too few staff to support a flood event of more than 36 hours.

Action - Review PR Duty Rota staffing arrangements; in hand via the CNFDR project for implementation in September 2000.

Responsibility - Public Relations Manager

7. Health & Safety

7.1 Summary

7.1.1 In total staff manned six incident rooms and the RCC and were involved in operations at some 30 sites across the Region during the event. Altogether some 150 staff were involved across the Region, primarily from Water Management and with support from Business Services and Environment Protection. This section focuses on two main aspects of health & safety during the event; those of staff managing events in incident rooms and those on site managing flood events, including data collection.

Key Success: No reportable accidents occurred during operations.

7.2 Outline of Arrangements

7.2.1 During the event Incident Rooms were opened at Colden Common in Hampshire, Saxon House in Sussex, and at Leigh in Kent. A Regional Incident Room was opened in Guildbourne House Worthing with the RCC also being manned up for the event. At these sites it is the responsibility of the Area Base Controllers and Regional Base Controller to ensure the Health and Safety of staff managing the incident. For those staff out on sites it is the Area Base Controller or representative with responsibility for ensuring the safety of staff out on Sites. The responsibility for the Health and Safety of Direct Works staff rests with the DW Manager.

7.3 Procedures

7.3.1 Area and Regional Incident Rooms should be manned in accordance with the Regional Incident Procedures (dated 20th June 1999).

7.3.2 To date assessments of these work environments have not been carried out (Key Issue HS/P/1). Additionally, the RCC layout reflects the needs of a single worker outside of an event, not the needs of many during an event. Depending on the outcome of the review of the requirements of the RCC – in relation to the RIR - (Key Issue EM/P/2) the layout of the RCC will need improving (Key Issue HS/P/2).

7.3.3 Within Incident Rooms staff typically worked 8 – 12 hour shifts over the event on short term rosters. Problems were encountered with staff not having adequate breaks within a shift to be able to have food and drink, and the availability of food was a problem at all sites. This is partly due to the lack of storage facilities and partly due to the time of year with garages and convenience stores not stocking fresh food at Christmas time. There is a need to review catering requirements during events in all Incident Rooms (Key Issue HS/P/3) and to review procedures to allow adequate breaks for staff (Key Issue HS/P/4).

7.4 Systems

- 7.4.1 The main system to support the Health and Safety of staff during an event is the Lone working system managed by the RCC. Overall this worked satisfactorily during the event when people used it but there are examples where staff did not register as lone workers and need briefing to ensure that they are aware of the arrangements (Key Issue HS/S/1).
- 7.4.2 Additionally during the Area wash up meetings it was apparent that there had been several 'near misses' that had not been reported. Staff need to be aware that these out of hours events can and should be reported (Key Issue HS/S/2).

7.5 Liaison

- 7.5.1 At present there is no formal requirement to liaise on Health and Safety issues within the Regional Incident Procedures for an event of this nature. HELP reports include a section on Health and Safety; Sitreps do not. This needs clarifying (Key Issue HS/L/1).

7.6 Emergency Response Roles and Responsibilities

- 7.6.1 During the event arrangements for managing the Health and Safety of staff varied across the Region. Overall the arrangements were satisfactory with excellent cross-functional support in Hampshire, where the Business Service Manager had sole responsibility for ensuring the Health and Safety of staff. This included recording vehicles used, mobile telephone numbers and appropriate protective clothing. In a few cases arrangements were not satisfactory with a small number of cases where line management responsibility was less clear, communication equipment was not issued and protective clothing was not used. There is a need to ensure a checklist is given to staff prior to departure for sites stating Agency requirements clearly (Key Issue HS/R/1). Additionally there is a need to designate an individual role with responsibility for health and safety, following the example in Hampshire (HS/R/2).

7.7 Key Issues & Actions

HS/P/1 Assessment of Incident Rooms

Issue - Incident Rooms need to be assessed as working environments, suitably equipped for the number of people who may be present during an event.

Action - Undertake H&S Audit.

Responsibility - Regional Health & Safety Advisor

HS/P/2 Layout of RCC

Issue - The RCC is set up for one person. During an event many people may work in the RCC and the layout needs to reflect this need.

Action - Review RCC Layout.

Responsibility - Regional Engineer (Flood Warning & Regulation).

HS/P/3 Catering Facilities In Incident Rooms

Issue - Catering facilities in incident rooms need to be adequate.

Action - Review catering facilities.

Responsibility - Business Services Managers

HS/P/4 Staff Breaks During Shifts

Issue - Staff need to receive adequate breaks during shifts.

Action - Review staffing levels in AIRs and RIR.

Responsibility - Area FD Managers and Regional Engineer (Flood Warning & Regulation).

