EA Southern.

Environment Agency Southern Region

May Floods 2000

Performance Review

Document History			
Version	**Date**	**Issued By**	**Status**
One	July 17, 2000	David Upton	Final draft for RMT approval
Two	September 6, 2000	David Upton	Incorporating comments from R Clubb, R Turner, S Key, R Francis, B Buckley.
Three			

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1 EXECUTIVE SUMMARY

This report looks at the Agency's response to flooding in Southern Region in May 2000.

a) Event Management

The Agency did quite well, but mistakes were made: most critically, about five Red Warnings were either wrongly issued or not issued at all. This was partly due to confusion between old and new incident response systems, inadequate RCC systems, pressure on staff, and lack of good liaison between different parts of the Agency. More generally, the Region's response plans have no statement of objectives.

b) Flood Forecasting

This was not an easy task. On the whole the Agency did well, though roles could have been clearer and there was a major failure to pass on RTS alarms. Liaison between RCC, Region and Areas was not good, and there was no automatic linkage between foreseeing an incident and making preparations to manage it.

c) Flood Warning

Dissemination of warnings was generally quite good but some were overlooked and others were delayed, in some cases by hours. This was partly due to AVM problems, but also to staff overloading and inadequate RCC systems. Most professional partners praised the Agency but at least one was very annoyed by a failure to issue warnings.

d) Emergency Response

On the whole the Agency seems to have responded well, though it would have had problems in a longer incident.

e) Public Relations

The Agency was slow to react and was not able to make much use of proactive opportunities to spread flood warnings through the media, or to improve its public image. Public expectations need to be better managed, and the Agency must make clear the extent to which it can help the public. Calls from the public were needlessly allowed to swamp the system. Areas differed significantly in how many lines they had available, and how quickly, to handle public calls. However media did not criticise the Agency.

f) Health and Safety

We are concerned that some staff worked for far too long. The 'Lone Worker' system as used in May also seems inadequate.

g) Other issues

- The Agency was too slow to follow up recommendations made by the review of the Christmas 1999 floods: many of the same problems recurred in May 2000.
- The Agency does not look at the cost of incident response: it should do so.
- In our view the Agency changes its response plans too often: what is needed now is a period of consolidation.
- Staff morale remains essential and there are signs of tension obvious even to us: the Agency needs to manage this problem carefully since its staff are its major asset.

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Appendices to main report:

2 LIST OF RECOMMENDATIONS

The following list includes some recommendations made in an earlier report, on the Christmas 1999 floods, which had not been implemented by May 2000, which in our view would have made a significant difference, and which as far as we know have still not been implemented. (These are marked '1999 recommendation' to distinguish them from our own new recommendations.)

Please note that we have made a relatively small number of specific recommendations. This is partly because many of the systems and procedures used in May 2000 are scheduled to change as a result of the CNFDR review. Where this is the case, further recommendations from us would be confusing.

Prepare and disseminate a clear public statement of what the Agency can and can't do during a flood to help the public. (And preferably, suggest other sources of help the public can turn to.). 44

Remind managers to set up and enforce proper duty rosters, to prevent staff working over-long hours during an incident. 49

Duty Managers in all relevant functions should be encouraged to ring around when an incident seems likely to develop, to identify staff whereabouts and compile a 'stand-by' list. 49

List of Abbreviations

ABC	–	Area Base Controller
AFDDO	–	Area Flood Defence Duty Officer
AIR	-	Area Incident Room
AVM	–	Automatic Voice Messaging
CNFDR	-	Changing Needs in Flood Defence Review
DW	–	Direct Works
DWM	–	Direct Works Manager
EWF	–	Emergency Work Force
FIDO	–	Flood Information Duty Officer
FWDM	–	Flood Warning Duty Manager
Professional Partners	-	Other agencies, such as Police, Councils, etc.
RBC	–	Regional Base Controller
RCC	–	Regional Communications Centre
RDH	–	Regional Duty Hydrologist
RDO	–	Regional Duty Officer

3 INTRODUCTION

This report, unlike the Christmas 1999 flood report, has been prepared by external consultants. We hope that what it may lack in detailed knowledge of Agency procedures, it will make up for by offering different perspectives.

- We have, for instance, consistently asked ourselves how the Agency's incident response would compare with that of a well-managed company in, say, a hazardous process industry.
- We have also tried to relate quantitative records of rainfall and river level or flow records to records of warnings issued, both data sets provided by the Agency. These are shown in graphic form in an Annex, but are drawn on throughout the report.
- We also prepared two questionnaires to record how the Agency, and its professional partners, viewed the Agency's handling of the events. These measurements underlie this report and are referred to frequently.

For simplicity and to make this report manageable, we concentrated mostly on Red Warnings as an output measure. These warnings are the most serious and carry the most implications for Professional Partners, and we felt that the Agency's performance in authorising and issuing them was likely to be a fair performance indicator.

Many of the Agency procedures used in May are due to change, as a result of the Changing Needs in Flood Defence Review (CNDFR). We interpreted our role as providing recommendations for improving the Agency's future services, rather than conducting a forensic enquiry into "what went wrong" - in other words, looking forward rather than backward. We have therefore not looked too closely at systems, or roles and responsibilities, which it has already been decided to change.

As in previous reports, a common numbering format for identifying actions has been used as follows. We have made few recommendations, for reasons explained in the text. Where we repeat critical recommendations still outstanding from the last flood incident review, these are listed in brackets. When making recommendations we have not suggested responsibility for implementation as this is beyond our brief or competence.

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

4 EVENT MANAGEMENT

4.1 Summary

Rainfall on 26 - 28 May combined with high water levels in catchments in Sussex and Kent to cause some flooding. This was not a major flooding incident, nor was it easy to predict: some of the rivers concerned are notoriously 'flashy'. (ie prone to unpredictable flash flooding). The Agency responded quite well, in terms of numbers of warnings put out and direct response. However, it dropped several catches: some warnings were missed, delayed, or wrongly issued. Liaison between parts of the Agency was poor. Chains of command are not clear, and there are no official objectives for Flood Response. The Areas were slow to respond, or at least to escalate their response, and much of the load was thrown on the RCC, which was not robust enough to support it entirely. The Agency's internal culture leads it to function as separate groups rather than as an integrated team. This is bad for both efficiency and morale, with groups often having little understanding of the stresses placed on other Agency staff.

4.2 Outline of Arrangements

A band of heavy rain entered Hampshire on Friday 26 May 2000 at mid-morning and exited Kent in the small hours of Sunday 28 May. This brought rainfall totals of 15-25mm and caused localised surface flooding. A second frontal system passed through between early Saturday evening (Hampshire) and mid-Sunday morning (Kent). This led to rainfall of 15-28mm in Hampshire, 17-45mm in Sussex (though we understand the high figure may be suspect) 19-35mm in NW Kent, and 22-29mm in SE Kent.

Coming after the first band, the second was enough to cause flooding on the Uck, Teise, Beult, Ouse, Cuckmere, and other rivers.

The Agency has three main roles, which are dealt with in the following sections. They are to forecast, detect and monitor flooding and decide to issue Flood Warnings (section 5); actually to disseminate these warnings to Professional partners and the public (section 6); and to take response action 'in the field' to remove obstacles, open sluice gates, and otherwise to lower the level of the flooding (Section 7). They must also manage the media and public response to their activities (Section 8), and they must undertake all of this in a safe manner (Section 9).

Based on figures supplied to us, the Agency put out 255 flood warnings, including 23 Red Warnings. (Warnings are often in two groups, one to the public and one to Professional Partners : in effect there were 12 Red warning decisions.) Some of these 'warnings' may in fact have been warnings being taken off: the figures supplied to us do not differentiate. Agency staff worked in the field throughout the period of flooding. We understand that only some 20 properties were actually flooded. (HELP reports specifically mention Uckfield Town Centre, the A21 at Lamberhurst, Five Oak Green,

Rutley Close in Robertsbridge, and caravan sites at Eberne and Seasalter.) Agricultural land was also flooded.

The Agency's record was not as impressive as it could have been. A small percentage of mistakes were made. At least two Red warnings were not put out, or delayed, and one Red warning was put out for the wrong flood warning zone. Some other warnings were delayed or put on 'Floodline' at the wrong level. Staff worked long hours and there was a lack of coordination. Public expectations of the Agency caused some problems, particularly in the numbers of calls received.

In fact, the Agency was lucky. Most of its mistakes went unnoticed. (Only one local authority was highly critical, and media coverage of the Agency was neutral or favourable. One question has been asked in the House of Commons about the events of the weekend.) Several Agency staff we interviewed said that only the short duration of the incident saved the situation: if it had gone on for another 24 or 48 hours, they thought real problems would have emerged.

4.3 Procedures

In all the procedures we saw, there seems to be no clear statement of the Agency's objectives or priorities during a flood incident.

Staff we spoke to saw two areas where they believed the Agency had short-term emergency response objectives:

- to issue flood warnings, at least 2 hours before the flooding takes place
- to open sluices, etc, and urgently repair damage or problems in Main Rivers that might otherwise make the flooding worse. (In practice this means removing obstacles, such as trees washed into culverts, which will prevent the rivers draining properly. Other problems arise when there is tidal flooding.)

The Sussex Area Flood Defence Procedures, for instance, refer to a 'suite of documents' covering how the Region 'discharges its responsibilities with regard to issuing flood warnings and managing flood defences'. (page 1) Clearly in an emergency no-one has time to read through and compare this suite of documents. Later on, the procedure defines the Agency's general duties and powers (page 3), and then defines the 'Flood Defence Aims' as:

> "to provide effective defence and warning systems to protect people and property against flooding from rivers and the sea."

This is true for normal Flood Defence activity, in the sense that it includes the creation of Regional Flood Defence Committees and IDBs and the long term provision of river structures. But it is not a definition of the Agency's responsibility during an incident, when they can do no more than take prompt action, within the limits of their resources, to protect certain people and certain property against flooding.

In some cases, Agency staff may be in the invidious position that damage will inevitably be caused to property, and their actions may affect which property suffers. In almost all cases they do not have enough resources to answer all demands, and have to set their own priorities. This may lead to complaints.

In many other cases, genuine hardship and flooding may take place in areas where the Agency is not able to respond, or which are covered by RFDCs or IDBs. There will be questions of priorities and resource allocation which staff will have to decide at the time.

The Agency may also be open to political attack if it can be alleged that it did not respond fairly or properly, or did not provide enough help to (say) vulnerable sections of the population.

For these reasons it seems to us essential that Agency staff should have a clear statement of their objectives and priorities in responding to a flood incident, and also of what they cannot do. Without this, staff are left to their own judgement. We have been consistently impressed by the high calibre and professionalism of Agency staff, and the fact that they usually seem to make sensible judgements, and to have a clear idea of their own priorities, but this is not the point. For reasons of consistency, and to defend itself if necessary when things do go wrong, the Agency must make it clear to its staff what it expects them to achieve.

EM/P/1

Issue - No clear statement of incident response objectives in Flood Defence plans

Action
The EA should agree a common statement of the Agency's incident response objectives, and add this to incident response plans so that all staff have a common statement of objectives to work to.
Responsibility - to be allocated

A further issue is the extent to which an incident should be actioned by Areas or by the Region. Under the procedures in force in May, Areas were effectively in charge of the field response. However, Regional staff believed that the Regional Incident Room should be opened up if two Area Incident Rooms are open. (This did not happen in this incident, largely because areas and region were using different generations of response plans (see below). The RCC were waiting for Kent to open its AIR. But Kent did not have an AIR in May: it had 'Operational Centres' instead, and these were open. The RIR (as the procedures existed in May) might have coordinated Flood Forecasting and PR.

This procedural point covers a wider issue. The way the Agency handles Flood Defence is changing. Increased public interest, and greater Agency responsibility (eg for issuing warnings) mean that the old system is under greater pressure.

The CNFD review is addressing such issues and new procedures will shortly come into force, so we have not dwelt on the old system other than to record that, in May 2000, there was an uncomfortable compromise, with some issues handled at area level and some regionally.

Issue	Handled at:
Incident Management	Area level, but RIR should open if 2 AIRs involved. However only Sussex had an AIR to open.
Forecasting	Not clear. Regional Duty Hydrologist and Area Duty Officers both involved. See next section: no clear linkage from forecast to Agency response.
Issuing warnings	Authorised by Area staff but issued by Regional staff (though Areas have limited ability to issue warnings if necessary.)
Operational Response (eg Direct Works)	Area
Health and Safety.	Not clear. RCC were central point for Lone Workers, but Area staff tasked and controlled them.
Public/ Media	Not clear. Regional PR staff, but all staff allowed to talk to media. Calls from public answered by RCC or Area, depending on call's inward route and staff availability.

At Regional Level, we feel that there was some confusion about the actual role of the RCC. In one sense it is simply a message switching system: taking in information and passing it on, and actioning flood warnings. Although in practice it requires considerable knowledge of the system, skill and patience, this is arguably a mechanical function: operational decisions are not involved.

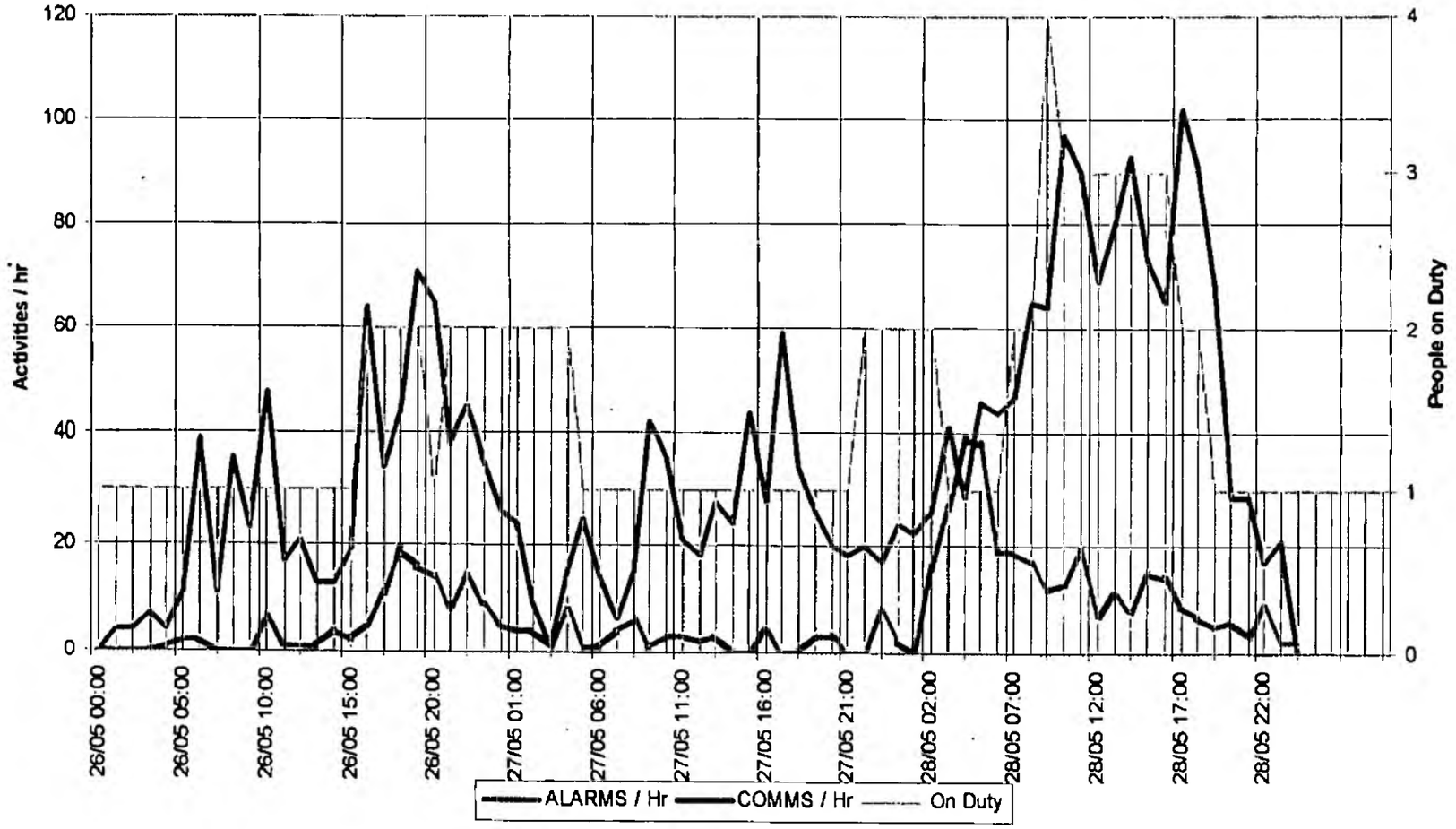
However, there was also a Regional Flood Warning Duty Manager (RFWDM), a Flood Information Duty Officer (FIDO), and a Regional Duty Hydrologist, who either based themselves in the RCC or worked through it. The role of the Duty Manager was partly to coordinate their activities, but not to manage the RCC operators. (This is done by the Lead Operator or the Regional Emergencies Officer if present. Under the new CNFDR procedures the Regional Base Controller is likely to manage the RCC as well as the RIR and Regional Forecasting Room.) PR was also coordinated at Regional level, and there was a need to brief Regional management who presumably had the right to take an active role if the incident was getting out of hand.

In our view, the role of the RCC began to change from a purely mechanical one until it became a sort of Regional Incident Room. At various times the RDH and the Regional PR officer were in the RCC. Alas the systems did not change accordingly. We suggest that the role of the Regional Incident Room needs careful thought. It is not fair to let the RCC develop into a compromise, which is neither a Comms Centre nor an Incident

Room. As shown by the graph on the following page, the RCC was heavily overloaded, and did not anticipate the overloading well.

Activity and staffing in the RCC

Lines represent alarms or calls coming in (left hand scale) . Hatched lines show numbers on duty (right hand scale).



The response from the Districts was variable. Both Sussex and Kent have Area Flood Defence Coordinators who come into action during larger events. The Sussex AFDC opened the Sussex AIR at around 10.00am on Sunday 28 May. Communications between the RCC and Kent were not adequate. (The RCC may not have been sure who was the AFDC. The actual AFDC only had a bleep pager and received no alarms.) Although Kent staff were working from Incident Control Points, the RCC was not fully able to contact these ICPs. In such circumstances the RCC is inevitably going to come under pressure to take more and more responsibility.

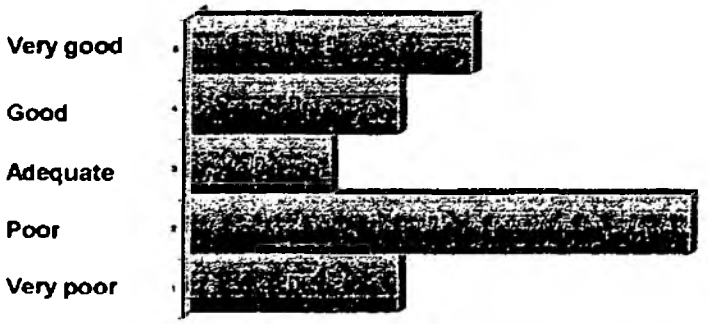
Most of the problems seem to have arisen when something 'fell between two stools', with Area and Region not meeting each others' expectations. The CNFD review addresses some of these problems and introduces a new structure which alters the balance between Area and Region. We cannot comment on how this will work out in practice. However the main problem in May 2000 seemed to be that there was no automatic linkage between the possibility of bad weather and flooding being noticed, and the RCC or Areas gearing up to handle the event.

4.4 Systems

The Agency has some very impressive systems in place. Rainfall and river flow/ level sensors across the region report in real time and a comprehensive management information system (the RTS) allows staff to monitor events in almost real time. Forecasting staff have access to a range of systems such as Hyrad. Despite this, as our questionnaire showed, many Agency staff were dissatisfied with the systems available to them in May.

Some systems clearly are good, but others are poor, and they are not well integrated. For instance, the RCC is not equipped or organised to the standards we would expect to find in a well-managed commercial organisation. Although £2.5 million was spent on a sophisticated and impressive Regional Telemetry Monitoring System (RTS), furniture in the RCC was lacking, or broken and unsafe. Up to six people were on duty in a room which is equipped to seat two, although it has computer and telephone facilities for five. It also has ten incoming telephone lines, adding to the pressure on RCC operators and 'stand-by' staff, who have been instructed that the Agency's call handling standard is that all calls must be answered within 15 seconds.

Agency Staff: Do you think Agency systems available to you were good?



Normally the RCC operator's job is done by one person. In this incident, other 'stand-by' staff arrived to help. (See chart on previous page.) There is a work instruction for dividing up the job into separate roles, but it is not clear and currently being re-written: so in May, everyone 'mucked in' and helped out. This is laudable but almost inevitably will lead to items being overlooked, or duplicated. (It would, for instance, be a good idea to allot one or two people solely to answering calls from the public, and others solely to passing Flood Warnings out, or passing telemetry or other information to areas. The RCC telephone system has 4 lines for public calls, 3 for internal calls, and one for emergency service calls, so it lends itself to this sort of use. This will help to keep public calls from clogging up operational lines.)

In addition, one person was apparently on duty for 16 hours at a stretch. It is not possible to maintain efficiency for this length of time. (There may also be HSE or employment implications.) Actions recommended after the Christmas 1999 floods (eg to move the area map to a better position) have not been undertaken, largely for budgetary reasons. Equipment appears to break down regularly – for instance two AVMs were out of action at various times during the incident.

This is no reflection on the officers concerned, who simply have too many calls on their time and budgets, and have to go through time-consuming internal procedures before expenditure can be authorised. But it does mean that basic mechanical methods of improving and systematising information flow were just not available, and mistakes were made as a result. The Agency was 'penny-pinching' here, and the results showed clearly in May when simple mistakes were made and went un-noticed.

EM/S/1

Issue -
The RCC needs to be properly upgraded with facilities for extra staff brought in during an emergency

Action upgrade RCC facilities
Responsibility - to be allocated

The Sussex AIR was still incomplete at the time of the incident and lacked some comms facilities. The Kent AIR was not complete. Kent staff worked from Operations Centres which did not have enough telephones and faxes. We understand these problems are now being addressed.

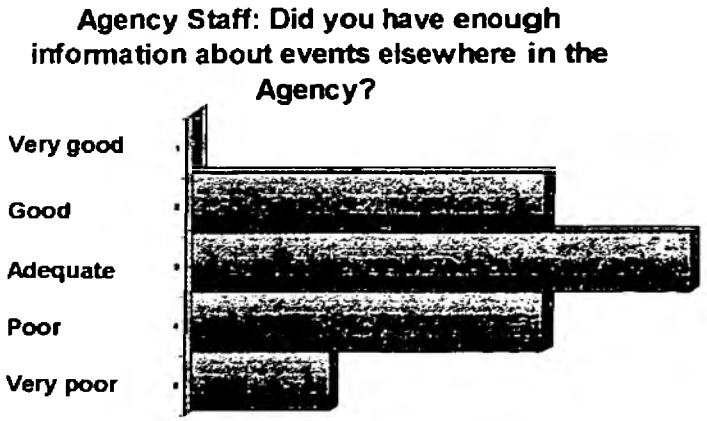
Staff working from offices other than their own experienced delays logging on to the system. (As one person who waited for an hour to log on in an area office said, it would literally have been quicker to drive back to his normal office, log on there, read his

emails, and drive back.) This may be a difficult problem to solve: but it would have helped if CIS staff could have been available over 26-28 May.

We do not make specific recommendations about these issues as work on the AIRs in Sussex and Kent is in hand, or has already taken place. However, it is worth emphasising that it is a false economy to cut back on telephones, faxes, and data links, and we hope that the new AIRs and the RCC will be properly and adequately equipped, as staff want them to be, and that all 'ex-directory' numbers will be freely available to the RCC.

4.5 Liaison

The Agency has a 'matrix' management structure. Within a Region, Areas have a great deal of autonomy. (There are three areas in Southern Region, two of which are further subdivided, so that there are in effect five different 'districts' – Hampshire (not involved in this incident), W Sussex, E Sussex, NW Kent, and SE Kent.) The Regional office provides some common services (eg PR staff) and also the Regional Communications Centre (RCC). In a multi-area incident, the Regional Office can open up its Regional Incident Centre and take a role in incident management. This did not happen in the May incident.



Liaison between the Region and the Areas/ Districts was poor. Between the Areas themselves it seems to have been largely non-existent. After systems, this was the second greatest single source of dissatisfaction amongst Agency staff, as our questionnaire shows. It was responsible for errors in both forecasting and warning dissemination. We deal with these problems in the following sections.

The Region is obliged to send 'HELP' reports, generated by the AFC, to the Agency Head Office in Bristol. Those shown to us were (from Sussex): 28 May 1310; 28 May 1855; 28 May 2330; (from Kent): 28 May 1445. Some Regional Flooding Situation Reports (RSRs or 'Sitreps') were also sent by Kent on 28 May 1830, 1945 and 2200, and on 29 May at '1.00' - not clear if this is 0100 or 1300.

Bristol subsequently commented that:

(a) the Regional Situation Report may provide a more satisfactory format for presenting flood information than the HELP report. (As we understand it, a HELP report is to be issued automatically when a Red warning is put out, but not until then. An RSR report

is intended to give a broader picture of a developing situation and can be issued at any time, whether a Red warning has been issued or not.)

(b) it would have been helpful if HELP reports from Sussex and Kent could have been produced at similar times, to give a better overall 'snapshot'.

(c) more information on the actual impact of the flood was needed.

HELP report users found it difficult to correlate the reports with radio news reports of the flooding. This is of course difficult to prevent, as the Agency cannot control either the accuracy or the focus of media reporting. A minor incident may be exaggerated whilst major ones are not mentioned. However, it is clear that the Agency Head Office needs to feel confident that the Region/ Area is reporting fully, so that the Chief Executive or Chairman can speak to the media if necessary, and the Director of Operations can make broader judgements about resource needs. The latter is especially important if other regions are involved in flooding at the same time. (As was the case on 26-29 May 2000, we understand).

We would urge that HELP reports (or Regional Situation Reports) should be more widely disseminated: they should be sent to all Areas/ Districts in the Region, and to neighbouring Regions or areas, and to the Duty PR officer. (At the moment they are originated by the Area, and sent to the RCC which passes them to Bristol, only. It was not possible for Kent and Sussex to issue simultaneous reports because the system does not allow either to know what the other is sending.) In holding training sessions for Agency staff we have noticed a general perception that HELP reports are a 'one-way' exercise: sharing them (and sitreps) more widely would make their value more obvious. Head Office have no objection to this.

EM/L/1 HELP reports

Issue - HELP reports or sitreps were not widely copied, and there was poor liaison amongst the region and the two areas.
Action -
HELP reports or Regional Flooding Sitreps should automatically be copied within the Region/ Areas/ Districts, including PR staff (and to neighbouring regions) and not just sent to Bristol
Responsibility - to be allocated

As regards the different Regional Situation Report and HELP formats, we found the latter easier to follow, of the specimens we saw. This is largely because the HELP format is less prescriptive and easier to complete. These formats are a national requirement and beyond our remit. However, in our judgement, the simpler the format and the easier it is to complete, the more information Head Office will get!

One minor point is that the RSR format is obviously stored electronically and users fill it in. Often they did not delete the prompts, or make clear where prompt ends and entry begins. This can be confusing but could be overcome by storing the prompts in a different type face.

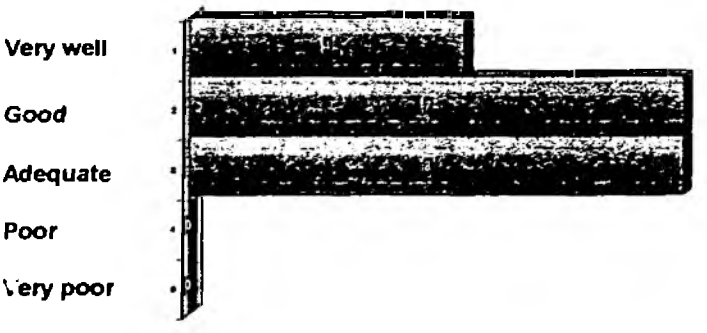
EM/L/2	Regional Situation Reports (RSRs)
Issue -	Confusing format: not clear where prompt ends and entry begins.
Action -	Store RSR prompts in a distinctive typeface
Responsibility -	to be allocated

In a major incident, perhaps it should be one role of the Regional Incident Room to summarise and coordinate HELP and Regional Situation reports from areas. As well as allowing the Regional Incident Room to take an overview, this will ensure that regional management know what National senior management are reading.

4.6 Emergency Response Roles and Responsibilities

The Agency has many advantages. First and foremost, it has skilled and dedicated staff. At all levels and in all locations they turned out without complaint and worked long and hard to perform what they rightly see as a public service. Staff have an impressive range of skills, qualifications, and experience and are rightly proud of this and of the work they do. As our questionnaire shows, they believe the Agency offers the public a good service, though they are not complacent. (We met with nothing but support whilst undertaking this review.)

Agency Staff: Did the Agency provide a good service to the public?



There are problems too. We found a strong 'them and us' culture. ("They don't understand our problems". "They kept us in the dark". "They expected the wrong things from us".) These and similar statements - about their own colleagues in the Agency - were made to us in most geographical locations and by people from several specialisations or functions. Internal information flow broke down on several occasions, at the macro- and micro- levels, so the comments are to some extent justified. But staff across the Region do not work together as a team – more as a series of sub-teams – and

energy is wasted resolving problems between groups rather than tackling the incident. There were occasional dangerous misunderstandings of what another group was doing, or could do. Some obvious resentments are still smouldering, weeks after the event.

Management of staff also left something to be desired, in the sense that proper duty rotas were not drawn up. Staff were allowed to work very long hours. Both Areas and Region showed some initial reluctance to call extra staff out, but in most cases, after the initial delay, too many people turned out, leaving no rested staff to takeover subsequent duties. (It is not always clear to us who is responsible for setting rotas when staff from different functions are working together.)

Morale within the Agency is critical. The Southern Region has some formal duty rotas, but in a major incident it relies on a 'catch-as-catch-can' system to provide an 'out of hours' response. Staff are telephoned at home and invited to help out. Most do so willingly. (In fact we were told of several instances where staff who were not at home would ring in to volunteer their services.) However, morale is a fragile plant.

Agency staff range widely in backgrounds and qualifications. Staff with higher academic qualifications in abstruse subjects (but little field experience) work alongside people with years of practical knowledge (but less sympathy for complex written procedures) and 'generalist' administrators.

The Agency's role is changing and it is becoming more bureaucratic. Fourty or fifty years ago the Agency's predecessor bodies looked after 'structures and gates'. Now, especially since the Bye report, they are as much concerned with the social impact of flooding. Public scrutiny and expectations are higher. What could once, we suspect, be left to the skill of individuals, now has to be written down in bureaucratic procedures, and exposed to formal reviews such as this one. Staff numbers have slimmed down, and many of the experienced field staff have been lost. Outside agencies impose other requirements – eg for senior Agency staff to attend at Police Silver or Gold controls.

We think it is important for the Agency to address morale issues as a high priority. At the moment it can rely on its staff to do their utmost. But this cannot be taken for granted. As well as the 'them and us' mentality, and problems with rostering, described above, there is also a perception that overtime payments, to staff who turned out to help with flooding over Christmas 1999, were unnecessarily delayed.

For these reasons we repeat here a recommendation made after the 1999 Christmas flooding:

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. (1999 recommendation)

Responsibility - Regional Flood Defence Manager/ AFDMS

Hopefully the CNFDR review will now clarify the situation, but we do suggest that the morale question is carefully monitored. It is never enough simply to rewrite the procedures.

5 FLOOD FORECASTING

5.1 Summary

This was not a catastrophic event. In rainfall terms, or damage caused, it was not comparable in intensity or size to the Christmas 1999 floods. (During this period, between 50 and 80mm of rain fell in three days, coupled with tides that in one area were the highest recorded since 1924.)

The rainfall was not at first clearly forecast by the Met Office, but a heavy rain warning had been issued to the Agency by 1030 on Friday 26 May. In each case the staff concerned have suggested to us that:

- the Sussex AIR should have opened sooner than it did (perhaps being readied on 27 May and opened early on 28 May instead of at 1000.)
- more Kent staff should have mobilised at an early stage
- the RCC could have better anticipated its own staffing needs.

Individual officers took what seemed to them to be sensible decisions based on the existing procedures and expectations. What is worrying is that the procedures and expectations within the Agency did not lead to earlier preparatory action. In effect, the brunt of the flood response was borne by Duty Officers at 3.00am on Sunday 28 May. It is almost as though the worsening weather situation and the wet state of the catchments took the Agency by surprise, yet the former was anticipated as early as 26 May and the latter was also known before the weekend. There seemed to be no automatic linkage between forecasting the event and preparing to meet it. (See recommendation in section 5.6)

There was also a breakdown in internal information which led to failure to authorise at least two Red Warnings, which staff concerned say that they would have wanted to issue. (See Annex for plots for Swalecliff Brook and Westbrook.)

5.2 Outline of Arrangements

Forecasting rainfall and river flows is more difficult than forecasting coastal flooding. There are fewer sources of information, and the forecasting models for rivers are more varied than tidal models, except possibly when there are unusually complex tidal areas such as the Solent Estuary. We understand that tidal considerations were not relevant to this incident.

The Agency's target is to provide warnings two hours or more before the event, but against this must be balanced the problems caused if unnecessary warnings are issued: wasted time, and a general loss of public confidence in the system.

There are three parts to the equation:

- weather forecasts from whatever source, to give an indication of expected rain. Forecasts typically occur a few hours in advance but become more specific and localised closer to the time.
- knowledge of the catchment and local conditions, to enable a judgement of the effects the rain will have. This is mostly available in advance.
- measurement of rivers, to monitor the incident as it unfolds. This is available in (almost) 'real time'. It is mostly supplied by telemetry. Where telemetry does not give adequate information, there is a 'semi-official' arrangement to call out staff for flood gauging at the site, but this is not necessarily effective out of normal working hours as staff are not on a formal rota and volunteers cannot necessarily be found.

The main forecast on which the Agency relies is the Met Office forecast delivered early each morning to the RCC. In May, this was assessed by the Regional Duty Hydrologist (RDH), whose task was to inform Areas if he believed that the actual weather might be more adverse than the forecast. (Under the new plans, the RDH role has been replaced.) The RDH consulted the Met Office, and also had access to weather radar, which he could see on his PC in the office or at home.

The next part of the forecasting equation is the state of the catchment areas. If these are already wet, heavy rainfall is more likely to cause flooding. By the morning of 26 May 2000, catchment areas were known to be wet. There had been 5-12mm of rain in Kent and Sussex and 1-6 mm in Kent, and a further 5-12mm fell over the night of 24/25 May.

Two spells of heavy rain fell on 26/27 and 27/28 May and triggered the flooding. Neither was originally forecast as 'heavy' by the Met Office. (The Thursday 25 May forecast predicted 'low' rainfall for 26 May, though by 26 May the prediction had been changed to 'High' for the band that arrived a few hours later, and at 1030 on 26 May a 'heavy rain warning' was issued. This was roughly the time the rain began in Hampshire, where there was no flooding. However, the rain appears to have increased as it travelled eastwards.) The Friday 26 May forecast predicted the 27 May rain as 'low', though again by 27 May this had been changed to 'High'.) There was thus no reason to expect trouble over the Bank Holiday until about 1030 on the Friday morning.

The 24 hour Met Office forecast is received quite early in the day, so it is at its least accurate for events over the next night. To supplement the Met Office forecast, the Duty Hydrologist has access to Hyrad weather radar, and can of course talk to the Met Office for updates. He also has access to all EA telemetry through the RTS system so he can monitor the effect of an event as it develops. (NB the Hyrad system is of much more use for weather coming from the West, which was the direction on 26-29 May. The Chenies receiver is not best able to pick up weather coming east from France.)

It is worth noting that a further Met Office forecast, issued late on 28 May, did predict heavy rain, which did not materialise (at least not in Southern Region). This forecast was apparently the source of some debate within the Met Office itself. We mention this to show that it Met Office reports can be wrong in both directions -they can overestimate as well as underestimate - and that the Agency must use a degree of skill in interpreting them.

5.3 Procedures

Once the Met Office forecasts were received in the RCC they were passed to the area offices and the RDH. (Though there were apparently no formal facilities or procedures for the RDH to receive the daily weather forecast from the RCC over the weekend / bank holiday, he seems to have done so on this occasion.) The RDH was responsible for disseminating any further information he may glean, directly to the areas or whoever he thinks needs to know it. (The RDH post will be replaced under the new system.)

RTS information, including alarms, is continuously monitored in the RCC at all times. The RCC page Area Duty officers, or others, when alarms occur. (There are specific instructions for each alarm situation stored on the RTS system in the RCC). The procedure for the RCC to notify the Areas of alarms is complicated. The RCC page the Duty Officer, who rings them. (Not all Kent staff had suitable pagers.)The RCC read him the alarm. They also print it out and fax it to the relevant District Office. The REO estimates that it takes about 3 minutes to print out and fax an alarm: with a peak alarm rate of 55 alarms in one hour on Sunday 28 May, this was clearly not acceptable. We strongly suggest that the Agency looks for a simple software fix to allow the RTS system to fax out alarms to District Offices automatically on receipt, and to page Duty Officers automatically as well. (See recommendation below, under section 5.4)

Once they are aware that an incident is in progress, Area Duty Officers and others who need it can have access to Hyrad and RTS from their offices or laptops. The actual decision to issue a Flood Warning is taken in the Area, because the Area have the best knowledge of the state of the catchment and of the flood defences, river banks, etc.

Until the Area Duty Officer is contacted, made aware that there is an incident, and logs on to the RTS, only the Region (RCC and/or Duty Hydrologist) know the extent of any problem. (RTS alarms do not sound in the Area offices: indeed there is no-one there outside normal hours to hear them if they did.) Once the Area Duty Officer had been contacted, it does not seem to have been consistently agreed whether it was his or her responsibility to monitor alarms on the RTS, or whether the RCC were still required to notify him of each one.

- RCC were in some doubt about this: some officers seem to have thought that once the Area incident room was open, area staff would be aware of the alarms.
- Area staff told us that the RTS alarms do not sound in their offices, and to pick up each alarm state as it occurs they would have to watch many channels of telemetry constantly. (However, we understand that there is an 'alarm view' screen, which would simplify this for them: it is possible some Area staff did not realise this.)
- The RCC procedures for faxing out alarms imposed a considerable delay - and seem to be mere duplication when the alarms could be seen 'live' on an RTS screen in the Area.

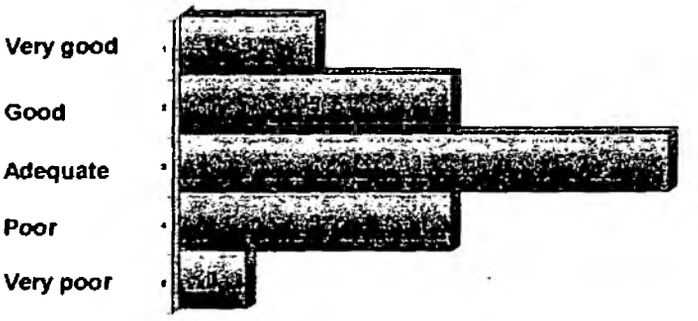
The new procedures under CNFDR will partly improve this situation, and hopefully will introduce some sort of linkage between the perception that a flood may occur, and the Agency gearing itself up to respond, eg by alerting staff, opening up response centres, and so on. The fact is that there was an expectation of flooding on Saturday 27 May, if

not before, but (unless you count the Leigh Valley Control Room) Area Incident Response rooms did not open. Area Duty Officers did not take any special precautions to call out 'second tier' staff, or in some cases to find out about possible alarms, until 28 May.

This misunderstanding was partly a result of the change between the old procedures and the new ones and the uncertainty between the two. RCC and Area staff seem to have had different expectations, and there was no attempt to make a formal transfer of responsibility.

On 28 May, at the height of the flooding, there was a gap of some four hours (0800-1200 on Sunday 28 May) when the Kent Area Office in Tonbridge did not get any notice from RCC of telemetry alarms. The Area Office did not realise this, and assumed that there were no alarms. It is not clear why this happened, and both Kent Area and the RCC have their own version of events and we have not attempted to analyse them in detail, as the new CNFDR arrangements will be very different. The RCC recollect (but cannot show log entries to prove) that they made numerous attempts to telephone the Area Office, but could not get through. Once Kent have an AIR in place, there will be more telephone lines (and we hope more people to answer them). It is a shame that more staff did not realise the existence of the 'Alarm View' screen. During the period on Sunday morning when they were not receiving alarms despite the obvious weather problems, they might otherwise have been able to check for themselves from time to time whether alarms were in force.

Agency Staff: Did you have enough information about events 'on the ground'?



As our questionnaire showed, many staff felt that they did not have enough information about actual rainfall or river conditions. This was partly because of this failure to pass alarms, though it also reflects a more general lack of feedback, eg from Areas to Direct Works Duty Officers or to the RDH himself.

The existing situation as regards on-site flood flow gauging is that little or none is carried out out-of-hours. There are no rosters in place to call out staff when flooding is forecast. An internal Agency paper suggests that implementing a roster would cost £5000pa in Sussex (and therefore presumably about £15,000 pa for the region), in terms of 'stand-by' payments and actual overtime payments if staff are called out. Both Kent and Sussex areas believe they have staff ready and willing to undertake this work(but for safety reasons, flow gauging requires double manning.)

Incidentally it was suggested to us that the new Flood Warning Codes, now being introduced, might have improved the situation by allowing 'Flood Watch' messages to be sent out on 26 May. We would also suggest that Regional Flooding Situation Reports could be sent out at this early stage, to alert Head Office to the possibility of a problem.

5.4 Systems

Following on from the discussion in the previous section, we suggest that
(a) the AIRs should have the facility to hear alarms when levels or rainfall reach trigger points
(b) the Agency should see whether the RTS can be set to automatically page duty staff when alarms are triggered.
(c) the RTS system should automatically fax alarms to Area offices if this is necessary, rather than having the RCC operators do it manually.

These improvements should be technically quite simple, and will provide a useful and automatic safety net to make sure that alarms reach those who need to know about them.

FF/S/1 Improvements in passing RTS alarms

Issue - RTS alarms need to passed manually from RCC to Areas.

Action -
Examine possibility of RTS system automatically paging Area Duty Officers when alarms are triggered; automatically faxing alarms to Area offices, and making RTS alarms sound in Area Incident Rooms when these are open.

Responsibility - to be allocated

The RDH could access Hyrad and the RTS on his laptop at home, though he could not get the latest images when running Hyrad on a laptop at home. Unfortunately however these two systems are not compatible with the Agency's intranet, so he could not also have access by email to his colleagues. To do this he would need two telephone lines and two laptops running simultaneously. When called in to Guildbourne House, he could not reach a phone whilst sitting at the RTS workstation in the Water Resources Office.

Various problems with the telemetry field equipment were identified earlier in the week beginning 22 May. Some had been fixed by the time of the event, some had not. This resulted in data not being available from some stations in the region though this does not seem to have been a serious problem .

5.5 Liaison

The RDH spoke several times to the Met Office and clearly enjoys a good relationship with them.

5.6 Emergency Response Roles and Responsibilities

It is not clear to us how the responsibility for analysing and reacting to forecasts was divided up between the region (ie the RDH or RCC) and the Areas (ie the ADOs). The latter have the same access to weather radar, and we believe they also have access to the Met Office forecasts. The role of RDH can be interpreted as largely a reactive one: to provide expert advice if asked, and to follow up with the Met Office any likely problems. Alternatively, it could be taken that the RDH should be more proactive and keep the ADOs up to date with meteorological forecasts. His main role seems to be to interface with the Met Office and disseminate Met Office views to the Areas.

The RDH had a further role, to run flow models for rivers, which appears to have been done partly at the request of Areas and partly at the request of the RCC.

As mentioned above, the main gap in the system was that there as no automatic linkage between the forecasting stage and the Agency response. Although it was clear on 26 and 27 May that a possible incident was building up, AIRs were not opened or prepared for opening, staff were not put on stand-by, and Duty Officers had to be woken up early on 28 May to respond to alarms. This seems partly to have happened because the chain of command is not clear. The RDH and RCC were not empowered to call out or stand by Area staff, and in any case specific Area knowledge is required to judge whether the forecast rainfall is likely to cause actual flooding. The Areas were perhaps not sufficiently aware of the developing incident.

Under the CNFDR system all these roles will be changed, so we make no formal recommendations. But we hope that the new system will provide mechanisms to ensure that the possibility of an incident triggers preparations within the Region and Areas. This should include clear lines of responsibility.

6 FLOOD WARNING DISSEMINATION

6.1 Summary

Based on the flooding forecasts made (see previous section), large number of Flood Warnings (about 95) were passed promptly and correctly through the RCC. Unfortunately several other warnings were either overlooked altogether, issued for the wrong zone, or issued at the wrong level. Taking only Red warnings, the most serious, we were told that:

- a Red warning, which Sussex requested the RCC to issue for area 4A1 (the River Uck) was actually issued for the wrong area (4B2). It will be recalled that Uckfield was the scene of the worst flooding.
- a Red warning apparently requested for 8A1, was not issued at all, although the RCC log wrongly shows that it was issued.

Red Warnings that were issued, and the reasons for any delay in issuing them, are summarised in the chart on the next page. This shows that:

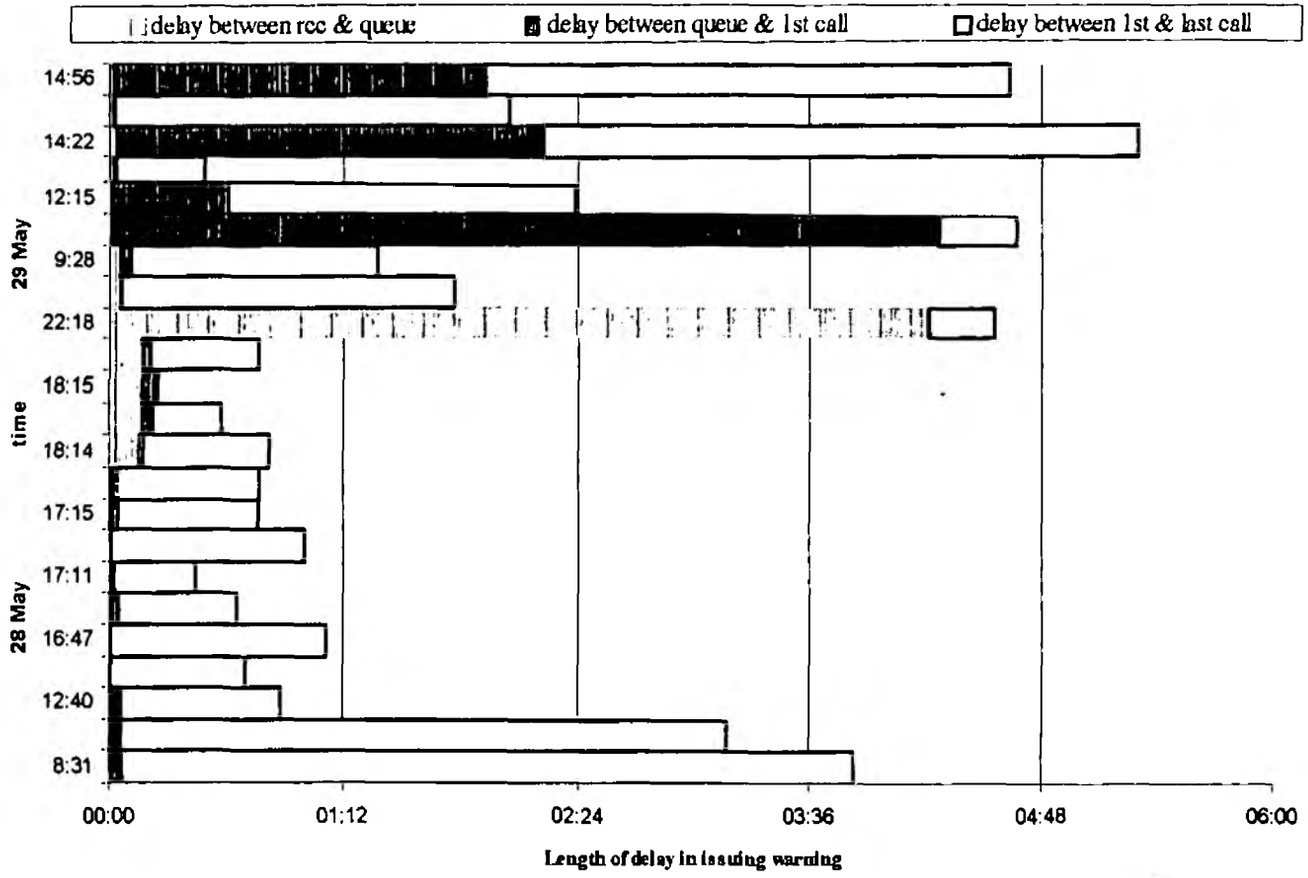
- the longest delay was about five hours and appears to have been due to AVM problems.
- there was one delay of about four hours between the RCC being authorised to issue a Red warning, and putting this on the AVM.
- delay occurred at all three stages: putting the warnings on the AVM, between queueing on AVM and transmission beginning, and the overall time to transmit.
- delay in each stage occurred at specific times: the RCC on the evening of 28 May, the AVM queueing on 29 May, and in actual transmission at various times. (Please note that warnings are often issued in two groups, but the time taken to execute each of the pair can vary greatly.)

Amber warnings also suffered delays, because Red warnings take precedence.

When warnings were delayed for several hours owing to problems with the AVM, no opportunity was taken to give these warnings limited distribution by the Surefax fax system. The originating areas were not told that the warning had been delayed and were therefore left under the impression that it had gone out.

There do not appear to be adequate logs from the RCC during this period, and we have deliberately not attempted to find out whether any one individual was responsible for these mistakes and omissions. This is because, for reasons stated below, we see this as a system failure: the system should be able to catch and handle human error, and it didn't.

Location of delay in processing Red Warnings



6.2 Outline of Arrangements

At the time of the incident, flood warnings were authorised by the Area Duty Officer (or other area staff) and passed to the RCC to issue. Here they could be issued using three processes:

- the AVM system, which telephones or faxes warnings through to the relevant list of numbers. When the telephone is answered, a recorded voice reads the message and the system moves to the next number. (There is no means of checking whether the right person has answered the phone, or indeed whether it was answered by a human or an answerphone.) Three attempts are made on each number before it is abandoned.
- the Surefax system, which does the same but only for a list of fax numbers. In fact this system does not appear to have been used at all by the RCC: possibly because they do not appear to have definite written procedures to do so. Failure to use Surefax meant that when the AVM failed, warnings were not issued at all. (Areas have local fallback arrangements to telephone warnings out individually, but they were not aware that the warnings had not gone out and did not put these fall-back arrangements into place.)
- putting them on a recorded message which is accessible by the public on the 'Floodline' number.

Issuing the warnings was the responsibility of the RCC operators and the Flood Information Duty Officer (FIDO).

These arrangements are due to change somewhat. The four AVM machines will be distributed (one in the RCC, one in each area) and areas will issue their own warnings through any of the four machines.

6.3 Procedures

The procedure for passing warnings to the RCC for issue at the time of the incident was not robust and put too much strain on the RCC operators. Warnings were authorised orally by Area staff and not confirmed in writing. No pre-formatted log sheet or board existed on which RCC operators could record the progress of a warning through their system. As mentioned above, the RCC facilities were inadequate for operation by several people. The RCC operator(s) had to deal with numerous calls from the public as well as passing on warnings and responding to RTS alarms.

Seven recommendations made after the Christmas 1999 floods, which would improve the passage of information through the RCC had not been followed up by May 26. We repeat them here:

6.4 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. (1999 recommendation.)

Responsibility - Regional Engineer (Flood Warning and Regulation).

(Note: we would add to the above that there seems also to be a need for procedures to initiate and control the use of Surefax.)

6.5 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 backup arrangements; in hand via CNFDR project for September 2000 implementation. (1999 Recommendation)

Responsibility – Regional Engineer (Flood Warning and Regulation).

6.6 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. (1999 Recommendation)

Responsibility – Regional Engineer (Flood Warning and Regulation).

6.7 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 on Floodline messages to be passed through from Areas to FIDOs. (1999 Recommendation.)

Responsibility – Regional Engineer (Flood Warning and Regulation).

6.8 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. (1999 Recommendation)

Responsibility – Regional Engineer (Flood Warning and Regulation).

HS/P/2

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 to accommodate more than one person during an event. (1999 recommendation).

Responsibility - Regional Engineer (Flood Warning and Regulation)

EM/S/1

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. (1999 Recommendation)
Responsibility - Regional Engineer (Flood Warning and Regulation)

What was the result, in practice? As one might expect, good on average because of the conscientious and dedicated approach of the staff concerned, but with some unacceptable failures when the system overloaded and failed, eg on the morning of Sunday 28 May when the worst flooding occurred. (Unfortunately, systems often fail at the most critical times: this is not "Murphy's Law", but simply because the demands on them are highest at those times.)

Statistics collected by the Agency for warnings at all three levels during 26-29 May identify four stages in the process of disseminating warnings:
(a) RCC list warning on their log (meaning either the time they were asked to issue it, or the time they did issue it. In some cases, when very busy, they logged it retrospectively, after issuing the warning.)
(b) Warning is 'queued' on AVM system
(c) First telephone call is made by AVM system
(d) Last telephone call is made by AVM system
Step (a) was logged manually by RCC operators; the other steps are recorded in the AVM system logs.

If these statistics are analysed to show the three time gaps - ie the times taken between each stage, the longest delays were:

(a) RCC log warning to warning queued on AVM system: maximae were 7 hrs 10 minutes (for two warnings on the morning of 28 May: F8AY1 and F8AY2.) Several other warnings on 28 May had long delays: for instance 4hrs 13 for F4B2R2, and 10

other warnings taking between 2hrs 30 and 2hrs 12 mins over this stage. On the evening of 26 May, 6 warnings took between 2hrs 5 mins and 1 hr 59 mins over this stage. Because of the way the information was recorded it is not possible to calculate a meaningful average time for this step. However it should be noted that apart from the warnings mentioned above, and four others which were logged by RCC but then apparently not actioned, all warnings passed this stage within 30 minutes, and most in half this time. The statistics do not show why these delays occurred - ie whether RCC operators were slow to respond, or whether the AVM system was down.

(b) 25 warnings took longer then 30 minutes from queuing on the system to first call by the system. Almost all these were on the early evening of 29 May. The longest time taken over this stage was 4hrs 59 mins. However the average time over this stage throughout the whole incident was about 5 minutes.

(c) From first AVM call to last AVM call is partly outside the Agency's control. If people answer their phones first time, the AVM does not have to repeat the call (which it does three times before giving up). Some warning lists are much longer than others: this depends on the density of population in the warning area, and the number of people requesting to be on the warning list. This stage was taking up to 4 hours, with considerable variation in the time taken to put through the same lists at different times. (eg F8A9R2 took 36 minutes on 28 May and 2 hours 43 minutes on 29 May). We assume this indicates a problem with the AVM system itself.

We understand that under the new procedures, warnings will be issued on AVMs by Areas themselves, and we cannot comment on how this system will work. However, we would point out that:

- area duty staff can control the AVM from home using laptop computers, though they will be under considerable pressure, or may be travelling. Area Incident Rooms can also operate the AVM machine.
- in a major incident, areas are likely to farm out flood warnings to each other and the RCC, as AVM machines become busy or break down. (As shown above, it can take several hours for an AVM to work through one of the longer warnings.) Once there are four AVM machines, each controllable by several people, there will be an even greater need to keep track of who has issued what!

This reinforces our belief (see immediately following section) that the Agency should develop a system to use its intranet to originate and track flood warnings through its system.

6.9 Systems

We suggest that the Agency Intranet should be used in future to authorise warnings, request their issue, confirm their issue, and later on to authorise and confirm their withdrawal or 'standing down'. When four AVMs in four separate sites are available, and in large incident Areas are likely to 'farm out' warnings to each other's AVMs or to the RCC AVM, chaos can easily develop.

A programme such as 'Outlook' could easily be used to create a set of forms and an underlying database to achieve this. This would make the RCC operators' task easier,

since they could find out at once what warnings were pending or had been issued. It would also provide written communications, making instructions clearer and reducing the risk of misunderstanding what are similar sets of initials (eg 4A1 versus 4B2). (Given the difficulty some areas experienced in logging on to the Intranet, however, we suggest that AVM operators in the RCC or areas should still accept telephone requests where it is essential to do so.)

FW/S/1

Issue - Flood Warnings are issued on an oral instruction and there is no clear system for keeping track of them

Action
The Region should consider using its intranet to authorise and track the issue of flood warnings. These should not (except in unusual circumstances) be issued against oral requests from Areas.
Responsibility - to be allocated

Both AVM systems used during this event failed at times. It is not part of our brief to look into the technical details of these systems, but it seems clear that either they are not reliable enough as currently set up, or that staff have difficulty in operating them properly. (They were also unsatisfactory during the Christmas 1999 floods.) Admittedly the systems were under pressure, but this is what they were bought for and they should be able to cope with it.

The AVM may make up to 3 calls to each number before it is answered. Statistics for this incident show an average of 134 calls being made for every 100 on the list: this appears to imply a rule of thumb that for every 3 people who need to be called, 4 calls had to be made, though the figure varied greatly between call-out lists.

In some cases, where warnings were not issued or were inaccurate, originators did not realise this for some time. We suggest that, rather than impose an additional duty on RCC staff to confirm warnings with originators, the AVM database for each warning should be amended to include the originator, who should be put at the head of the list. This should be cheap to implement, and automatic in operation, and will provide immediate feedback. We also suggest that where an AVM warning list includes local media, the Regional PR duty officer should be included at the head of the list, or at lest before the media are reached. Even under the new arrangements when Areas issue warnings on their own AVMs, this will provide a useful check that the system is actually working.

FW/S/2

Issue - Duty Officers were not automatically told when warnings issued

Action
The AVM and Surefax systems should be configured to make sure that the first calls in any warning are to the originator of the warning, so he/ she can check that it is going out and accurate. They should also give early notification to the Regional PR Duty Officer.
Responsibility - to be allocated

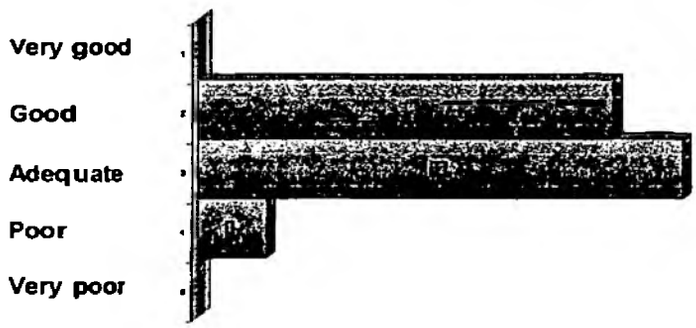
The 'Floodline' system is intended to take the weight off Agency staff by providing recorded messages for the public. During normal office hours, if callers require a human response, Floodline calls are answered by BT operators on contract to the Agency. It was pointed out to us that neither the Christmas 1999 nor the May 2000 floods occurred during office hours. BT Operators were not available and Floodline was therefore of limited use in both instances.

We understand that the Floodline contract is currently being reviewed. It is for the Agency to judge whether the cost of 24 hour operator coverage is justifiable. It certainly provides an alternative means of flood warning dissemination and of answering basic questions form the public, which would have helped greatly in this incident.

6.10 Liaison

The main liaison is between Agency staff and Professional Partners who are the most important 'customers' for Agency flood warnings. We sent questionnaires to both Partners and Agency staff and this section draws on the answers we received. (See also section 7.5, below)

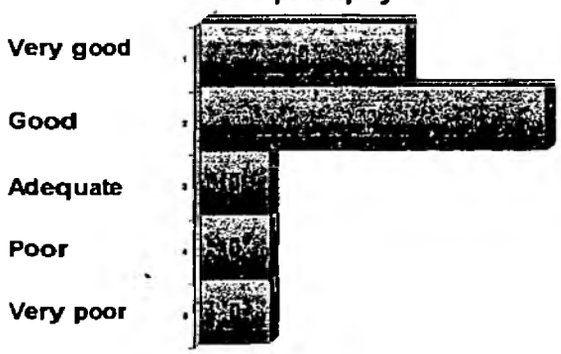
Agency Staff: Did the Agency provide a good service to Professional Partners?



Agency staff felt that they had provided a good or adequate service, with some failings (particularly in relation to the Canterbury local authority, which should have received 'red' warnings that were never issued.)

The feelings of Agency staff were largely reciprocated by the Professional partners. If anything, Partners have a higher regard for the Agency's services than Agency staff expect them to have. On a scale from +2 (very good) to -2 (very poor) the Agency rated their service to Partners at an average of 0.3 Partners rated the Agency's response at 0.8. Although one partner was very dissatisfied, and one dissatisfied, three thought the service was very good and the rest thought it was adequate or good. (It is worth pointing out that, in one case in Sussex where a Red Warning should have been issued but was not, staff informally warned the local authority that the situation might worsen, so the authority was able to react in time.)

Partners: Did the Agency act appropriately and promptly?



6.11 Emergency Roles & Responsibilities

See section above on procedures. Roles will change as a result of the CNFDR so we have not made specific recommendations.

7 EMERGENCY RESPONSE

7.1 Summary

The Agency had staff in the field throughout the period 26-29 May undertaking activities. Relations with Professional Partners are largely good. (Contacts with the public are covered in the next section). In practice, however, the Agency's 'Permissive Powers' are to warn and to maintain the unimpeded flow of rivers. The Professional Partners have the job of directly mitigating flood damage.

7.2 Outline of Arrangements

Direct Works (DW) operatives are controlled by a Direct Works Duty Officer in each area or sub-area. He or she is asked by his 'client' (the Area staff on duty) to perform particular functions. He then finds staff, by telephoning round, and allots the tasks to them. This system seemed to have worked well, with two provisos:

- Duty officers said to us that they would benefit from more feedback and information, so that they could plan ahead and allocate their staff most effectively, rather than responding on a 'one-off' basis to each request. (The new EDO role will help here.)
- In Sussex (though not apparently in Kent) there was great pressure on Direct Works staff. Had the incident lasted longer, they would not have been able to respond to all requests for work.

The nature of the field work is such that outside contractors, or even other agency staff, cannot easily be used to do it. So much depends on local knowledge. Even within the DW staff, operatives are highly specialised.

Professional partners, such as local authorities and emergency services, should be notified by the AVM or Surefax systems, or failing these by direct contacts from the Areas. In most cases this happened, but not in all.

7.3 Procedures

There are a bewildering set of internal Agency documents concerned with Flood Defence and other emergency response. There are:

- general emergency procedures for the areas and the region laid down in the RIPS, which include specific instructions on Flood Defence emergencies.
- Flood Defence procedures for each area (ie Kent, Sussex and Hampshire) which are different in format as well as local content
- Manuals for the Duty Hydrologist, Duty Press officer, and others.
- Individual notes and procedures held by the RCC on paper systems or on the RTS (which, for instance, say what action is to be taken in the event of specific alarms being sounded.)

On 25-28 May, these documents were at different stages of readiness. For instance:

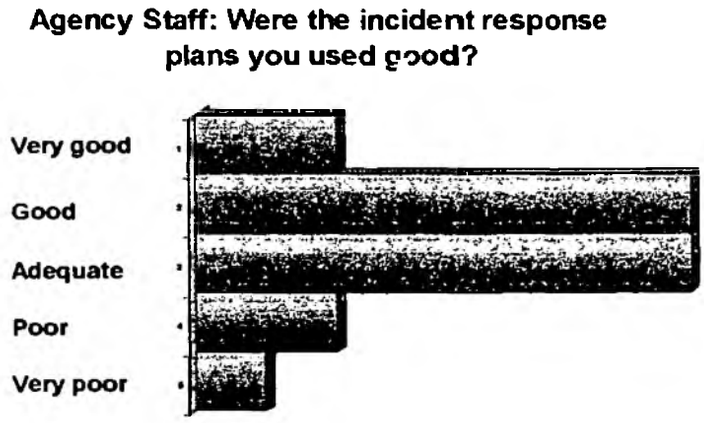
- The RIPs had been rewritten to take into account the new procedures due to be introduced in September as part of the CNFD process.
- The Region was operating on the old system, eg with an RDH.
- The Sussex area Flood Defence Procedures were based on the RIPs. For instance they had an ABC and a 'senior tier' response.
- The Kent Area Flood Defence procedures were also based on the RIPs but Kent did not yet have an AIR. Consequently their 'senior tier' response was not always clear.
- IT systems required were not yet in place - eg there were only 2 AVMs, not the four needed.

(In order to simplify the description of roles, we attach in appendix 15 a diagram showing the old terminology (still mostly used on 25/28 May) and the new post-CNFDR terms, as far as we understand them.)

Once again, this is no reflection on the staff concerned. There are several reasons for it.

- For historical reasons, the Agency has a bewildering variety of legacy systems and plans. Attempts are being made to systematise these, but local needs require local modifications of the system.
- In many cases change will be expensive, as incompatible physical IT systems are in place which may not fit in with the central pattern.
- Staff are under constant pressure from a variety of new initiatives, such as the revised Flood Warning Codes, the revised Incident Categorisation scheme, and so on, all of which require new manuals, changes to existing manuals, and training for those who have to implement them.
- Because of the matrix management structure of the Agency, and the semi-autonomy of the Areas, each area has different priorities and tackles different things first. (Similar problems also apply within functions.)

This seems to have puzzled us more than it puzzled EA staff, who felt fairly happy about the emergency response plans they were using. Where the problems seem to have arisen is that staff did not appreciate differences between each others' plans - eg that RCC did not realise Kent would not open its AIR, since it did not have one. Many staff may not realise how many plans there are or how they interact.

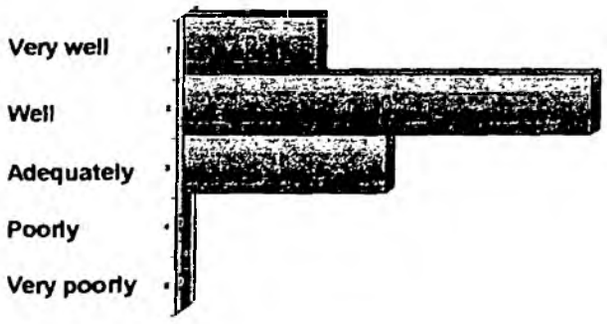


7.4 Systems

Not specifically relevant. See previous sections for problems with AVM and Surefax.

7.5 Liaison

(Partners:) Did the Agency understand your role in this incident?

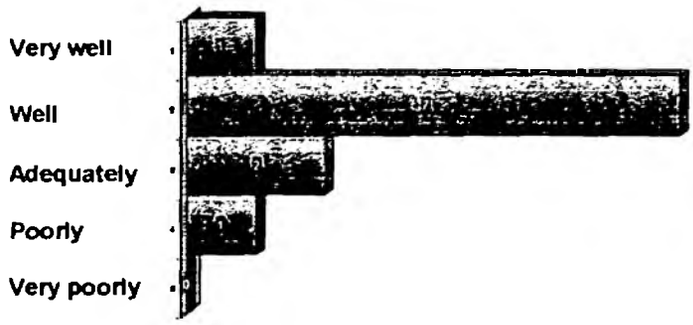


Much of the Agency's work on Flood Defence takes place before an incident rather than during it. This involves continuous liaison with local authorities and emergency services to make sure, amongst other things, that these bodies can work together with the Agency during an incident.

The Agency has spent a lot of time thinking about flood defences and incident response, and has developed sophisticated procedures and plans. At the practical level, knowledge of how catchments respond is increasingly stored in these procedures, through detailed lists of river features, preset warning levels and response instructions, etc. Good working relationships have been developed with most local authorities and emergency services.

This has clearly been successful, as our questionnaire shows. Partners felt that the Agency understood them, at least adequately, and that they understood the Agency's role in an incident such as this. The exception was one partner which felt it had a poor understanding of what the Agency was doing. (This was Canterbury City Council, which commented: *"I clearly understand EA's overall role but have no knowledge of what they do locally which appears to be very little... problems could be eased by much better liaison during events and NOT by more regional meetings... "*)

Partners: Did you understand the Agency's role in this incident?



Other comments made on these questionnaires included:

(From a local authority*)"The Agency were not aware of what was happening in the eastern end of East Sussex 'because it comes under Kent'. This is a*

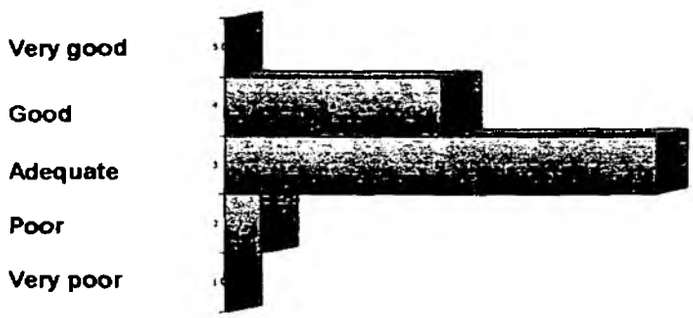
major confusion and needs to be clarified. I thought it was agreed in the early days of the Agency that areas were to be commensurate with Police boundaries. Throughout all this time we received no calls from Kent area."
(Note: any AVM warnings they received would have come from Worthing, at Kent's request.)

(From a Police force) *Advantages of working with Agency included; "direct contact and response to questions in easily understood layman's terms....[but]... concern was expressed when warnings went to total cancellation - with further comment that Yellow warnings would be reintroduced in a few hours time. It would be better if warnings are scaled down through red amber and yellow, as a lot of work is required when warnings are received."*

(From a local authority): *"We need to be sure that the EA understand that our resources are stretched when they issue red flood warnings. We are not a blue light organisation. We need to have a better understanding why we are now getting red warnings (2 so far this year) when we have not had any for years."*

The Agency was less happy with the response from its Partners. In general this was adequate but Agency staff we spoke to cited examples of poor information flow - eg Police not passing their press releases to the Agency.

Agency Staff: Did the Agency receive a good service from Professional Partners?



The Agency may need to continue its efforts to explain its own needs to its Professional partners. The last two quotations above indicate that at least two partners do not share the Agency's mind-set!

ER/L/1 Misunderstandings between Agency and Professional Partners.

Issue - Some professional partners are still not clear about the Agency's role and procedures.

Action -
The Agency should continue and deepen its liaison with Professional Partners, making sure they understand what the Agency does and why.

Responsibility – to be allocated

8 PUBLIC RELATIONS

8.1 Summary

Because it did not gear up in time, the Agency was slow to react, late to brief the media, and could not handle the very large number of calls it received. However the press and public were not generally critical.

We feel that the Agency should have three priorities during an incident like the May flooding:
(1) to use the media to warn the public of the risks and give general advice on what to do
(2) to make clear what the Agency can do to help, and preferably where the Agency can't help to advise property owners where else to seek help
(3) to present the Agency's response work in the best light. This is important to secure continuing public and political support, and hence funding, for the Agency.

Objective (1) was not entirely met, as the media themselves were not fully and promptly informed of events, partly due to failures in the AVM system, leading to late warnings, and partly because the PR team were not fully up to date themselves and their press releases were issued later then they would have liked and media deadlines missed .

Objective 2 remains a problem (see below). The public seem to be confused about what they Agency can and can't do to help them, and the Agency needs to put this right.

As for objective (3), in practice there was reasonable coverage of the flooding but little media comment on the Agency's role, and we were told that none of this was critical. There has been one question in the House of Commons about the Agency's role in the incident. The Agency would have been more proactive with the media if it had been able to respond more quickly.

8.2 Outline of Arrangements

Calls from the public or authorities came in several ways:

- through the Floodline number. (This has a set of recorded messages giving any warnings in force for specific areas, but the caller can also choose to speak to a human being. In such cases they are put through to the RCC outside normal hours. During normal hours the system is manned by BT operators, but this was not relevant during the period covered by our report. We understand that the Agency is discussing a plan to put Floodline Calls through directly to Areas during major incidents: this would have helped greatly in May, had the area offices been open early on Sunday morning when people were most concerned about the flooding. However, Operational staff are adamant that operational response should take priority over responding to public calls. Our concern is that it is sometimes difficult to separate the two responses: if either is badly handled, the other gets worse.)

- through the Agency emergency number, in which case the call was put through directly to the RCC
- by calling the Regional or Area offices using numbers in telephone directories etc. Calls to the Regional Office outside normal hours are answered by the RCC. Arrangements at area offices depend on whether incident rooms are open or not.

In most cases, the RCC referred calls from the public to the area Incident Room or Operations Centre, if this was open. (The RCC may be able to answer some queries themselves, but the more specific questions require a degree of catchment knowledge.) At one stage we were told that the RCC answered 112 telephone calls in one hour. Most of these were presumably from the public. The figure does not include those calls, if any, which did not get through because the RCC line was engaged.

If an Area AIR or Incident Room was not open, the RCC operators often tried to deal with calls themselves. According to figures given to us by the REO, this increases the average time taken to handle public calls from 30 seconds to 5 to 7 minutes. During this time the operator cannot take any other action, eg pass on alarms or issue flood warnings on the AVM. So any delay in the system can quickly become a 'vicious circle'

Typically, public callers either want information ('will my house be flooded?') or are offering it ('there is a tree blocking the culvert near 'x''). The latter calls can simply be noted and passed on, but Direct Works officers pointed out to us that the public are sometimes wrong, or tend to exaggerate. Asking the right questions when the call is received may save a lot of time later on. Direct Works staff were sent to some incidents which were either trivial or non-existent.

Interest from the media, in addition to coming in by phone, may also lead to media approaching EA staff 'on the ground'. (We did not hear of any cases where this happened.)

Three press releases were issued:
28 May 0900: warning about flooding on the Uck. (This must have confused the media, as the Red warning to which it refers had actually been issued for the Cuckmere. The press release correctly ascribes it to the Uck.)
28 May 1550: warning to navigators on the Medway.
28 May 1900: further general flood warning.

PR staff pointed out that the 0900 release was too late for the critical 0800 and 0900 radio and TV news. (The Red warning was only issued at 0830.)

8.3 Procedures

We refer above (section two) to the lack of a basic statement for Agency staff of the Agency's objectives during a Flood Incident response. This may in turn lead to confusion amongst the public: for instance a booklet published by the Agency contains the statement:

> "The Agency is responsible for protecting the public and property from flooding."
> (Fact Files: River Arun, page 11)

As we understand it, the Agency has powers to put other bodies in place (eg RFDCs, IDBs) and to agree arrangements with them. During an incident, it is only empowered to provide warnings in certain circumstances, and to undertake certain emergency works in certain areas (typically Main Rivers and coastlines.) It does not have a general duty (or the ability) to help any property owner who is affected by flooding. During an incident, much of this duty falls to emergency services and local authorities as well as to RFDCs, IDBs, etc. Indeed the Agency is probably one of the last bodies actually to be involved in physically helping members of the public or property owners, though it is a key source of advice through Floodline and Flood Warnings..

However Agency practice is inconsistent: for instance we were told that one area in a nearby region supplies sandbags to the public, but we do not believe that anyone in Southern Region does this.

Unless Agency staff put out a clear and consistent message, they are likely to give rise to high public expectations. We were told that when Direct Works staff arrive at a flood site, local property owners often expect them to produce sandbags and help to protect individual properties. When told that the Agency officer has no sandbags and (as may be the case) has come simply to watch the flooding and report back, the property owners are unhappy and sometimes abusive.

(Incidentally, staff are given no specific training in how to respond to difficult or stressed individuals, whether in person or on the telephone.)

We suggest that a short and simple statement of the Agency's responsibilities in a Flood incident should be prepared; it should make clear what the Agency can and can't do. This should be used by everyone responding to the public or media.

PR/P/1 Lack of simple statement of Agency capabilities and duties in a flood incident.

Issue - The public are unclear about what the Agency should do, or can do, to help them. Expectations are higher than reality.

Action -
Prepare and disseminate a clear public statement of what the Agency can and can't do during a flood to help the public. (And preferably, suggest other sources of help the public can turn to.).

Responsibility – to be allocated

At the time of the incident it is not clear to us if any consistent procedures existed to require notification of PR staff of what was happening. The Regional PR office has a duty rota to ensure that a PR officer is always contactable through the RCC or Areas. Area plans refer to PR in general terms but we cannot find any specific instruction to the Areas to notify the Regional PR team. (Kent and Sussex plans assign 'Regional PR' to the Regional Flood Warning Manager, but it is not clear whether this is an instruction to notify the PR Duty Officer or not.) The RIP requires the Regional Duty Officer to tell the Duty PR officer if a Severe Flood Warning is issued or an Area Major Incident declared. (Neither of which seems to have happened, in formal terms.) At the time of the May incident there was a Regional Flood Warning Manager and a Regional Duty Hydrologist in place, but no 'Regional Duty Officer'. We think this is another case where overlapping procedures caused confusion. Hopefully the new procedures to be introduced in September after the CNFDR will clear this point up, so we make no recommendation.

In the May incident, however, the Regional PR duty officer was first notified of the flooding by BBC Radio Kent. (This is not good. The PR officer is the 'voice of the agency' and if she was unaware of the flooding it would sound to the BBC as though the Agency as a whole was unaware of what was going on, which was not true.) Flood warnings are faxed to the PR office, but this is no help if the office is empty.

The official position on speaking to the media is that any member of staff who is approached by the media may speak to them, but that they should check with PR before doing so. However, some field staff (we were told) take this to mean that they should not speak to the media at all and should refer all journalists directly to PR.

As far as we know, Regional PR staff do not receive HELP reports or other flooding sitreps. We think that they should, as this would help them to keep track of events: see recommendation in section 4.5 above.

8.4 Systems

Large numbers of calls came in to the Agency over the period. They were a serious problem for Region and Areas. (See graph in section 4.2)

The facility exists in the RCC, and the Sussex Area Incident Room, to separate out calls and allot them to different extensions. However the pressure on staff answering these lines often meant that internal Agency calls could not get through. When there are enough staff in the room concerned, a more systematic attempt seems to be made to separate public calls from operational ones. We strongly recommend that certain extensions should be designated for certain purposes, and marked as such with signs, and that at lest one line into each control room or incident office should be kept entirely free from 'public' calls. This is the procedure in the RCC and Sussex.

We suggest that Kent should also set up separate lines and give the telephone numbers of these to the RCC. (The RCC need to know both, so that they can forward public calls, and also make internal calls.) Because Kent did not open an AIR with dedicated facilities to handle calls from the public, it was far more difficult for the RCC to pass on calls to them. (This in turn contributed to the pressure on the RCC, who had to try to give substantive answers to calls they could not pass on.)

All staff we spoke to experienced the problem that large numbers of 'public' calls prevented them from dealing with 'internal' calls, or from getting through to their colleagues who were permanently engaged.

As regards alerting staff, we suggested in the section on Flood Warning Dissemination systems above that AVM warning lists which include the media should also include the Duty Press Officer at the beginning, so that the latter hears before the former!

One system which is missing is something to issue prompt alerts to navigators (ie boat operators) on the Medway. This has not usually been a problem in the past, because flooding tends to occur in winter when there are fewer boats around. This incident took place on a May Bank Holiday, when there were more navigators on the river. Boatyards were telephoned at 10.30am on 28 May; and the PR team issued a press release at 3.50 pm on 28 May, warning of flooding risks, which may have been carried by local radio and reached navigators in time. Otherwise, however, warnings have traditionally been disseminated on notice boards and therefore would not be in time.

8.5 Liaison

There were some problems in liaison. Although Agency staff sent copies of their own press releases to Professional Partners, this was not reciprocated.

8.6 Emergency Response Roles and Responsibilities

With control of incident response after the CNFDR being firmly held in the Areas rather than at regional level, it seems to us that there is a risk that the (regional) PR staff will be marginalised. They do not have easy access to control rooms or AIRs (except for Sussex area AIR which is five minutes' walk from the Regional offices) and no obvious place to go to get information about what is gong on, or to find expert interpretation of it.

Area procedures need to make sure that the Regional PR Duty Officer is contacted as soon as it seems that an incident may be developing, and that thereafter he/ she is given full and regular briefing. We suggest that PR should be seen as

- a means of disseminating flood warnings at least as important as the AVM system
- a means of keeping callers off the telephone lines elsewhere in the Agency.

It is in everyone's interest to keep them up to date.

8.7 Being proactive

The Agency missed opportunities to reinforce its own image, largely because the PR team were notified late and were only able to react to queries, rather than having the time to plan a proactive response. This is a shame. The Agency is coming under increasing scrutiny and has to live up to high expectations. It needs to present its case well, and this can only be done if PR staff are given full and prompt information so that they can plan ahead

In general the Agency starts off on a good footing: it is on the side of the public, and contributing to solving a natural problem. More can be made of this. Almost certainly, the public do not realise the extent of telemetry coverage, or the depth and professionalism of the incident response system, which the Agency has put in place. This can easily be rectified: for instance, when Incident Rooms are opened up, it would be possible to invite a TV crew to film inside one of them for a few minutes, and to show them the RTS in action, and actual 'real time' reports coming from affected rivers. Where Agency staff or contractors are tackling problems on the ground, eg repairing flood defences, we suggest that the Agency should tip the media off and allow them to film selected activities, subject to safety considerations and warning staff on the ground in advance. This will give the sort of images that the visual media like (or sounds for radio); it may also help other Agency activities to go unmolested. (We have not made a formal recommendation to this effect, as Mr Kemp is well aware of the possibilities and in the best position to judge how best to respond to each incident: he should be left to do so. We note that some members of EA staff see problems with inviting the media to view the Agency at work, but we firmly believe that, properly handled, the benefits far outweigh the risks.)

If the Agency does not make the most of good coverage, there is always the risk that the public mood will turn round. This might happen, for instance if there were complaints that flood warnings had not been given when they should have been, and property suffered as a result. It is most likely to happen during a long incident: after the initial shock is over, the media like to look around for 'what went wrong' stories.

9 HEALTH & SAFETY

9.1 Summary

According to the Regional Safety Officer, there were no reportable injuries related to the incident response and no reported 'near misses'. (Two 'near misses' were mentioned in answer to our questionnaire.)

Agency staff worked for excessively long hours (due partly to pressure of events and shortage of staff, but also sometimes to poor rostering) and we are not quite sure how the Lone Worker system was operated.

9.2 Outline of Arrangements

The main risks from a flooding incident are likely to include:

- persons being swept away by flood water, or falling into water from damaged river banks or structures
- road traffic accidents due to bad weather or drivers in a hurry
- damage to structures such as houses, bridges, electricity infrastructure, etc., which may fall.

All these risks are aggravated if the person involved is a 'lone worker' or is working long hours under pressure to resolve a difficult situation.

9.3 Procedures

Environment Agency staff are not an 'emergency service' and they are not expected (or trained) to take risks to help others. But they do have a general sense of public service, and a pride in their work, especially in their response to an incident, which may lead them to do whatever seems necessary to achieve critical objectives. This is admirable. However staffing must be adequate to meet objectives if this keenness is not to lead to increased risks to staff.

Responsibility for safety lies first and foremost with individual staff. However, those who task them have an additional responsibility to make sure that they do not send anyone into a dangerous area, that they brief staff as well as possible on conditions to be expected, and that staff are relieved and rested after suitable times. We heard several anecdotal accounts of staff working over 12 hours at a stretch, in some cases much longer. As such long hours are against Agency policy, we did not seek to identify those involved, but they included both 'office' and 'field' workers.

It would have been almost impossible for the Agency to respond fully if some staff had not worked excessively long hours. We suggest the solution to this is not a system to monitor hours, but paying more attention to 'catch as catch can' systems, making sure staff home telephone number lists are up to date, using limited 'standby' arrangements

when bad weather is likely, and so on, in order to maximise the numbers of staff available. When staff are available, then they should not all be allowed to come on duty at once: some sort of rota needs to be set up. Responsibility for doing this varies, but we think all managerial staff should be reminded of the need to set up rotas and to keep part of their teams 'resting' at any time during an incident.

HS/P/1 Remind managers to set up duty rotas and ensure staff are not asked (or allowed) to work dangerously long hours.

Issue - Staff worked long hours. Too many staff were on duty at times, leaving no-one 'resting' to take over the next shift.

Action -
Remind managers to set up and enforce proper duty rosters, to prevent staff working over-long hours during an incident.

Responsibility – to be allocated

'Catch as catch can' call-out rotas seem like a bad idea at first sight, as they depend largely on chance and staff support. But we were told that they worked quite well in this incident. The alternative of paying staff to be on standby carries costs, and may paradoxically limit the number of staff available. (People may take the view that if they are not being paid to be on stand-by and someone else is, then they are not available: whereas now everybody turns out who can do so.)

We suggest that the Region might consider introducing an informal internal 'state of alert' system. When it seems as though an incident might occur, the Area Duty Officers and possibly other managers should have the authority to ask staff if they will hold themselves broadly available, eg by giving contact telephone numbers if they are away from home during the next few days. (If they are unavailable, or out the region, for any specific period, they should say so and say when they will be back.) A limited payment could be made for this, though perhaps not as much as a formal 'stand-by' commitment. If the incident does not occur, well and good. If it does, then the Duty Officers have an up-to-date list of who is available and when, and can plan their rosters accordingly.

In the May incidents, it was clear during Friday that there might be problems over the weekend. A 'state of alert' system might have given managers a wider pool of staff to draw on.

HS/P/2 Introduce an informal 'standby' system

Issue - The 'catch as catch can' system could be made more efficient

Action -
Duty Managers in all relevant functions should be encouraged to ring around

when an incident seems likely to develop, to identify staff whereabouts and compile a 'stand-by' list.

Responsibility – to be allocated

Lone workers are required to log in and to give check times at which they will call RCC or the Area office to confirm that they are well. However, from responses to our questionnaires, it seems as though very few people were prepared to admit any responsibility for lone workers. Answers to our questionnaire reported lone workers logging on with the Kent Area office because they could not get any reply from the RCC; others reported logging on with the RCC but taking a long time to get through. (This is not good: if the 'lone worker' were injured and attempting to contact the Agency to call for help, he or she needs to be able to get through. In practice of course he or she would probably call emergency services first. But such was the pressure on the RCC during this incident, that we cannot be sure they would have noticed a 'lone worker' missing his check call time.)

We understand the Lone Worker system is now being amended by the Agency Head office, and so will not comment on it further.

9.4 Systems

As far as we know there are no specific systems for safety issues relevant to this incident.

9.5 Liaison

Not applicable.

9.6 Emergency Response Roles and Responsibilities

Not applicable.

10 OTHER COMMENTS

Follow-up of previous incidents.

Some of the actions recommended in the report on the 1999 Christmas floods had not been carried out by 26/28 May 2000, and many of the same complaints recurred in our own analysis. The Agency is not learning from its mistakes, or at least not learning quickly enough.

Items identified in the Christmas 1999 report were assigned target dates for follow-up, and the Agency is more or less up to date with its target dates. The following table summaries the 43 issues or problems identified in report on Christmas 1999 floods, and actions so far taken to resolve them.

Target date set by Agency for completing follow-up of issue	Number of issues to be completed by target date	Of which, number actually completed (as at 13/6/00).	Percentage of total actions completed
31 March 2000	4	4	9%
30 April 2000	3	2	14%
31 May 2000	5	5	26%
31 June 2000	20	0	
31 July	9	0	
31 August	1	0	
other (*)	1	0	
total	43	11	26%

(*) One other issue, 'review RCC and RIR location and activities to improve communications', was not given a completion target date, but set aside, 'to be addressed under [Guildbourne House] refurbishment.'

Although follow-up is almost on target (subject to a lot of work being done in June) a maximum of 11 of the identified actions (out of 43) had been completed by 26 May 2000. Many of the actions could not be followed up before June, because the Agency's internal budgetary procedures can impose a delay of 6-8 weeks to set up an approved project, without which capital expenditure cannot be undertaken.

Leaving aside judgements from hindsight, were the target dates too generous? On the one hand, flooding is not normally expected in May and Agency staff might reasonably have thought that the actions need not be in place before next winter when further serious weather was more likely. However, we understand there had already been one flooding incident in the Kent Area between Christmas 1999 and May 2000. (In April 2000).

As discussed earlier in this report, some of the issues not yet followed up caused significant problems once more during the May incident: eg:

- "review the RCC location and activities"
- "review RCC layout to accommodate more than one person during an event"
- "review procedures to provide clear guidance on opening and closing Area Incident Rooms"

- "review and update Flood warning Dissemination Procedures to ensure stand-down arrangements and operation of remote AVMs are clear."
- "Public Call handling (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."

We do not intend any criticism of the staff involved in the follow-up exercise. They have many other calls on their time and limited budgetary authority. In some cases they are dependent on outside suppliers. They are also engaged in other exercises, such as the Flood Warning Code Changes, which require a lot of work.

But the fact remains that the Agency has had two serious flooding incidents, five months apart, and had demonstrably not implemented major lessons learned from the first, in time for the second.

Assessment of costs.

We also note that in preparing post incident reports, or in thinking about incident response, little attention seems to be paid to cost. However, the availability of money is one of the main factors which determines whether issues identified during the response are followed up. We suggest it would help the Agency:

- to work out roughly how much incidents cost them, and therefore how important it is to their own 'bottom line' to meet demands for extra equipment, training,, etc.
- and to be able to identify any aspects of the response which may cost disproportionately more than they contribute, so that available funds can be prioritised.

We do not suggest that counting the cost of an incident should become a bureaucratic chore, but we believe the post-incident reviews should make a rough estimate of costs. Many or all expense items appear to be carried on 'normal' budgets, and it would clearly be a waste of time to try to identify (say) extra telephone calls made during an incident.

Most people we spoke to believe that staff overtime will be the major contributing cost. Despite several requests, the only cost figure we were able to find was overtime for Sussex Area Direct Works, which spent a total on overtime of £4,300 plus £330 for use of a van.

There is currently a proposal within the Agency to set up a duty roster of Flood Monitoring staff to be called out during incidents. This would involve quantifiable overtime and 'standby payments'. However, it is difficult to put ideas such as this in context, without some idea of the overtime normally incurred during an incident.

Secondly, we assume that the cost of employing direct labour, and hiring in contractors and plant will be another identifiable cost centre. In this incident it does not seem to have happened, but it is apparently common in marine flooding incidents.

Too many plans?

Stirling Reid Limited have worked for the Agency, and its predecessor the NRA, since 1994. During this time the organisation has gone through many changes and has brought a wide range of organisations and disciplines under its wing. Despite many teething troubles and internal rivalries, it seems to have done this successfully.

What concerns us is that this process seems to have generated very many new emergency response procedures. As fast as one is introduced and staff begin to become familiar with it, another is brought out. (For instance, at 26 May, three changes were pending: the RIPs had been revised to incorporate the CNFDR recommendations but other new plans derived from CNFDR had not been issued, there was a new Incident Assessment System, and new Flood Warning Codes, each requiring training before they could be used.)

Whilst we do not question the need for any of the individual changes made over the last six years, we do feel that the cumulative effect is to confuse staff and to leave them 'punch-drunk' with procedures and initiatives. In practice, some parts of the organisation appear to pay lip service to the latest procedures, and in the meantime to do pretty much what they have always done. Local variations on procedures, whether official or unofficial, are common, and add to the confusion. (For instance we conducted a training day on 4 May 2000 for Southern Region staff. Our report afterwards identified local differences of practice or expectations on duty rotas, Lone Worker procedures, and the safety responsibilities of Area Base Controllers or Site Controllers. These were not due to unfamiliarity of new staff, but to different local practice.)

We therefore strongly hope that nothing in our report will be taken to call for a new procedure, or will lead to further major amendments to existing ones. Instead we hope that the Agency will take the existing plans and procedures and continue to disseminate them, giving staff adequate training and allowing them to assimilate these plans before they are changed again. We have also where possible suggested that new duties or checks should be automated, using the Region's intranet rather than amending the procedures to give staff yet another thing to think about.

People

We referred to staff morale and related problems early in this report and make no apology for ending on the same note. The Agency is like a service business in this respect: its major assets are its employees. If they become disillusioned, do not understand each other's problems, or leave, the organisation's ability to respond to flooding incidents will suffer damage. There are already quite clear tensions within the Agency Southern Region, which we have described above.

It is difficult for an external observer to suggest any remedies for this situation. However, based on our experience of similar issues in the commercial world, we would suggest the Region considers the following:

- giving staff experience of each other's jobs and problems by short internal secondments and attachments. (eg Area staff might spend a few days sitting in the RCC with an operator, and operators might spend some time going round with Direct Works staff or in the Leigh control room.)
- introducing internal 'seminars' in which Agency experts can talk about their subjects. These might be held at lunchtimes and freely open to all Agency staff (and possibly external bodies such as local authorities). They might cover such things as how the forecasting system works, how the RTS and telemetry systems work, and so on.
- introducing catchment visits, so that Area staff with direct knowledge of a catchment could spend a day taking a minibus-load of other staff around, pointing out the major features of the catchment with special emphasis on what would happen during flooding. These trips could include short meetings with local authorities and emergency services. They could follow up flooding incidents where the Agency has responded successfully, so staff can learn at first hand how their work matters. They should be open to any and all Agency staff.

In the longer term, it would be helpful to introduce a formal 'knowledge base', held on the intranet, so that staff can easily look up catchment information. (For instance, there seems to be no easy way for RCC staff to find out which telemetry gauges refer to which river.) It would also be useful if the 'knowledge base' could eventually include all warnings in force and other information needed during an incident. (This would be easier if our recommendation to authorise and track such warnings on the Agency intranet was adopted.)

We have not made formal recommendations here as we feel that these suggestions may need to be adapted to fit the Agency's culture, which is different in some ways to commercial organisations where we have seen these ideas work.

11 APPENDIX – TERMS OF REFERENCE

1. INTRODUCTION

The Southern Region of the Environment Agency suffered flooding in its Kent and Sussex Areas over the Bank Holiday weekend of 26/27/28th May 2000.

2. AIMS OF THE REVIEW

- Collate views of the Agency's 'Professional Partners' of the Agency's liaison with them during the event - **key contacts CEPOs**
- Gather data on the Agency's internal management of the event e.g. event logs, recorded conversations, interview a small selection of staff, to form a record of the event management – key contacts – **Sean Key, Richard Francis, David Bonner**
- Benchmark progress against the issues raised in the Christmas Floods 1999 Performance Review – key contacts **Russel Turner / David Murphy**
- Compare Agency actions against extant procedures (RIPS, Area procedures)
- Identify issues arising
- Identify issues relevant to new Agency procedures being written for CNFDR (Changing Needs in Flood Defence Review) – key contact **David Murphy**
- Produce a written report and present it.

The thrust of this review is incident management, it is not a technical hydrological exercise.

12 KENT AREA REPORT

[to be supplied by Kent area]

13 APPENDIX – SUSSEX AREA REPORT

[to be supplied by Sussex Area]

14 APPENDIX – ANALYSIS OF QUESTIONNAIRES SENT OUT TO AGENCY STAFF AND EXTERNAL BODIES

Summary of multiple choice answers

			average
external questionnaire			
	Q4	Do you understand the Agency's Incident Response procedures?	0.7
	Q5	Did you understand the Agency's role in this incident?	0.7
	Q6	Did the Agency understand your role in this incident?	1.0
	Q7	Did the Agency give you enough information?	0.6
	Q8	Did the Agency act appropriately and promptly?	0.8
internal questionnaire			
	Q4	Were you clear about your own role in the incident response?	1.6
	Q5	Do you think Agency systems available to you were good?	0.1
	Q7	Were the incident response plans you used good?	0.4
	Q9	Did you have enough information about events 'on the ground'?	0.1
	Q10	Did you have enough information about events elsewhere in the Agency?	-0.2
	Q11	Did the Agency provide a good service to Professional Partners?	0.3
	Q12	Did the Agency receive a good service from Professional Partners?	-0.3
	Q13	Did the Agency provide a good service to the public?	0.8

Note: scores were marked from, +2 (very good) to -2 (very poor). Any score below 0 is cause for concern. The target in each case should be a score between +1 and +2.

15 NEW AND OLD INCIDENT MANAGEMENT ROLES

Old roles were mostly in use on 26-28 May, although the Regional Incident Procedures were in use at that time and these use the new terms.

Level	Old Title	New Title	Changes in role
Region		Regional Base Controller (RBC)	With Regional PR Duty Officer, sits in Regional Incident Room - not opened in May 2000.
	Regional Flood Warning Manager (RFWM)	Regional Flood Forecasting Officer (RFFO)	Together constitute the 'regional forecasting room' - not opened in May 2000.
	Regional Duty Hydrologist (RDH)	Monitoring Duty Officer (MDO)	
	Flood Information Duty Officer (FIDO)	See FWDO below	no longer responsible for issuing flood warnings from Region
	RCC Operator(s)	RCC Operator(s)	no longer responsible for issuing flood warnings on AVM
Area	Area Duty Officer	Area Duty Manager	
	Flood Defence Coordinator	Area Base Controller (in minor incidents, FWDO or ODO may be ABC)	Manages Area Incident Room (AIR): open in Sussex but not Kent in May 2000
	See FIDO above	Flood Warning Duty officer (FWDO) and assistant (AFWDO)	now responsible for issuing warnings on AVM from Areas
		Operations Duty officer (ODO)	
Either Area or Sub-Area	Direct Works Duty Officer	Emergency Duty officer (EDO)	
		Site Controller	

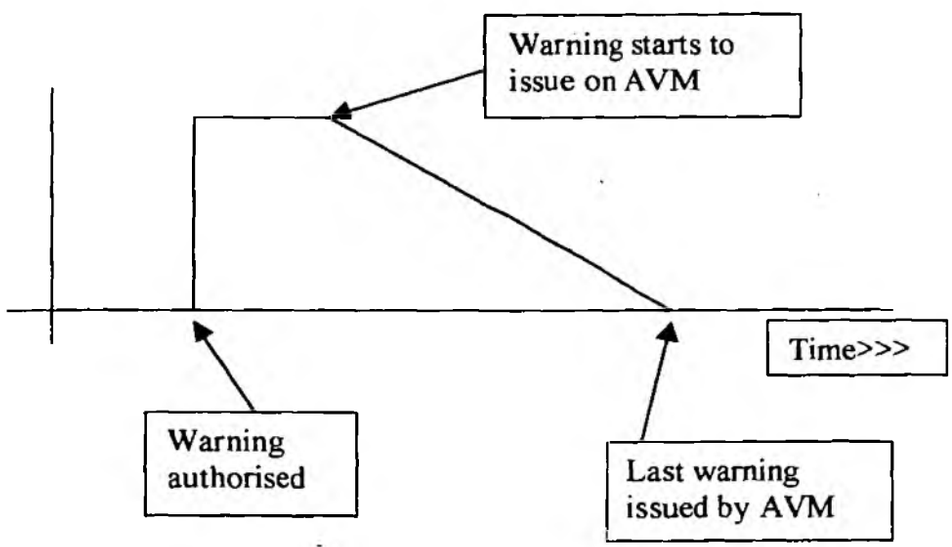
16 APPENDIX – CHARTS OF RED WARNINGS

The following charts combine information supplied to us by the Agency to show the timing of separate but related events for some Red Warnings (and for two cases where serious flooding occurred but a Red Warning was not issued.)

The horizontal axis represents the actual times on 26-29 May when the events took place. (Timings are not accurate to more than about 15 minutes.)

First on each chart we have shown the rainfall (coloured green) and the river levels (coloured blue). These are based on hydrological data supplied to us by the Agency. The vertical axis combines different units: it is only meant to give a general indication of the levels. We have only shown one rainfall and one river level monitoring point per chart, for simplicity: in fact decisions are often made using two or more sets of data.

Secondly, we have superimposed on this data representations of the warnings being issued. Timings for these are based on a second data set given to us by the Agency. Warning numbers are given: where warnings were one of a pair they are marked with an asterisk (eg F8A9R1* was accompanied by F8A9R2, but we have only shown one for the sake of clarity.) We have plotted these data as follows:



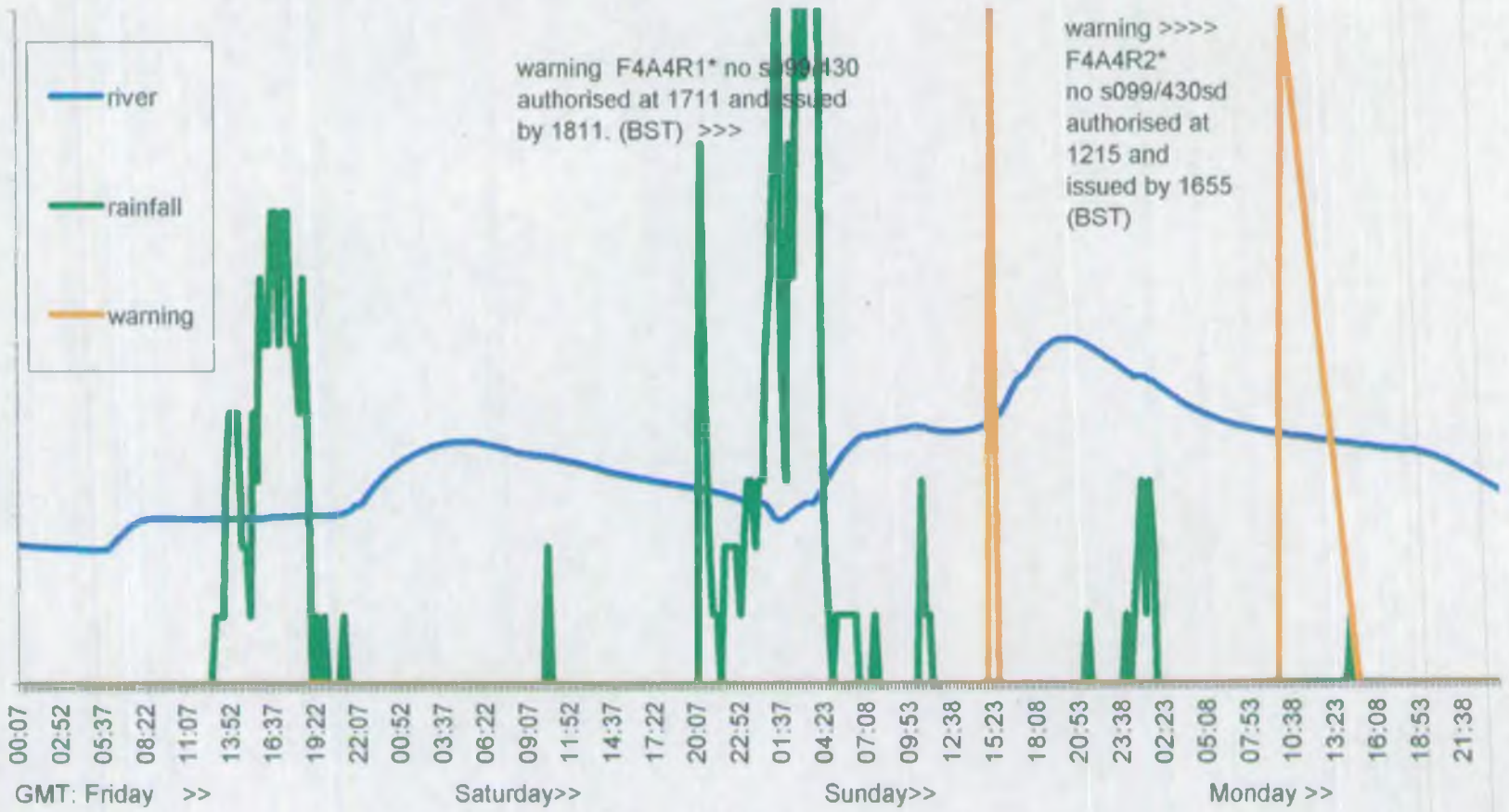
Thus, the time between the line leaving the horizontal axis and rejoining it is the period during which the Agency was issuing the warning. A flat top (in one warning only) indicates delay in the RCC: a sloping right-hand line indicates delay in the AVM.

Each chart therefore shows graphically:
(a) the speed with which a decision was taken to issue a warning, which is largely a function of the Agency's ability to make forecasts
(b) the speed with which the warning was disseminated.

In each case, superimposing actual event data makes visually clear whether the warning was in time to be of use.

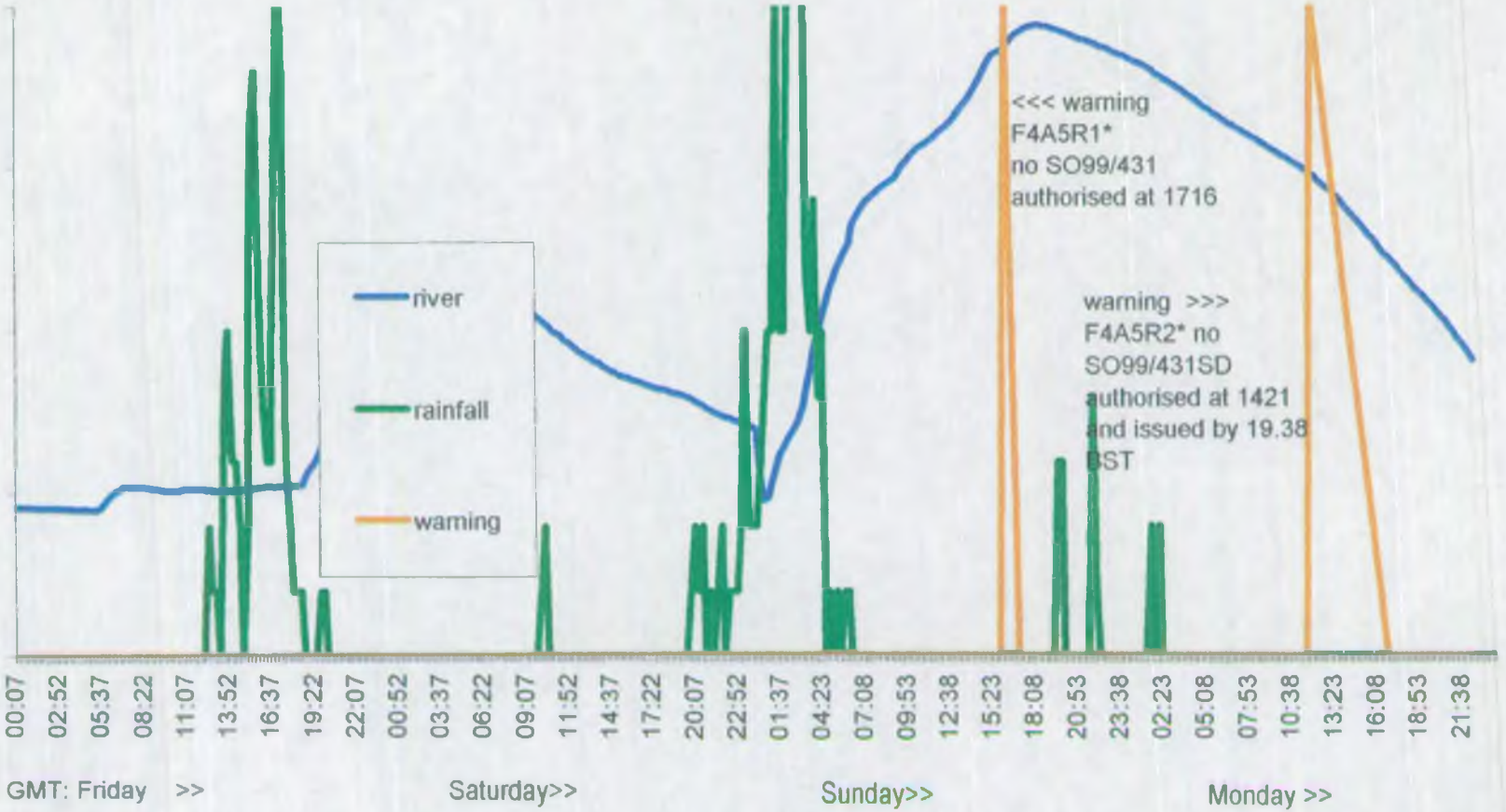
River flow, rainfall, and warning data for River Ouse (4A4)

Sources: Popes Wood Rain Gauge, Barcombe U/S River Level, 26-29 May



River flow, rainfall, and warning data for River Ouse (4A5).

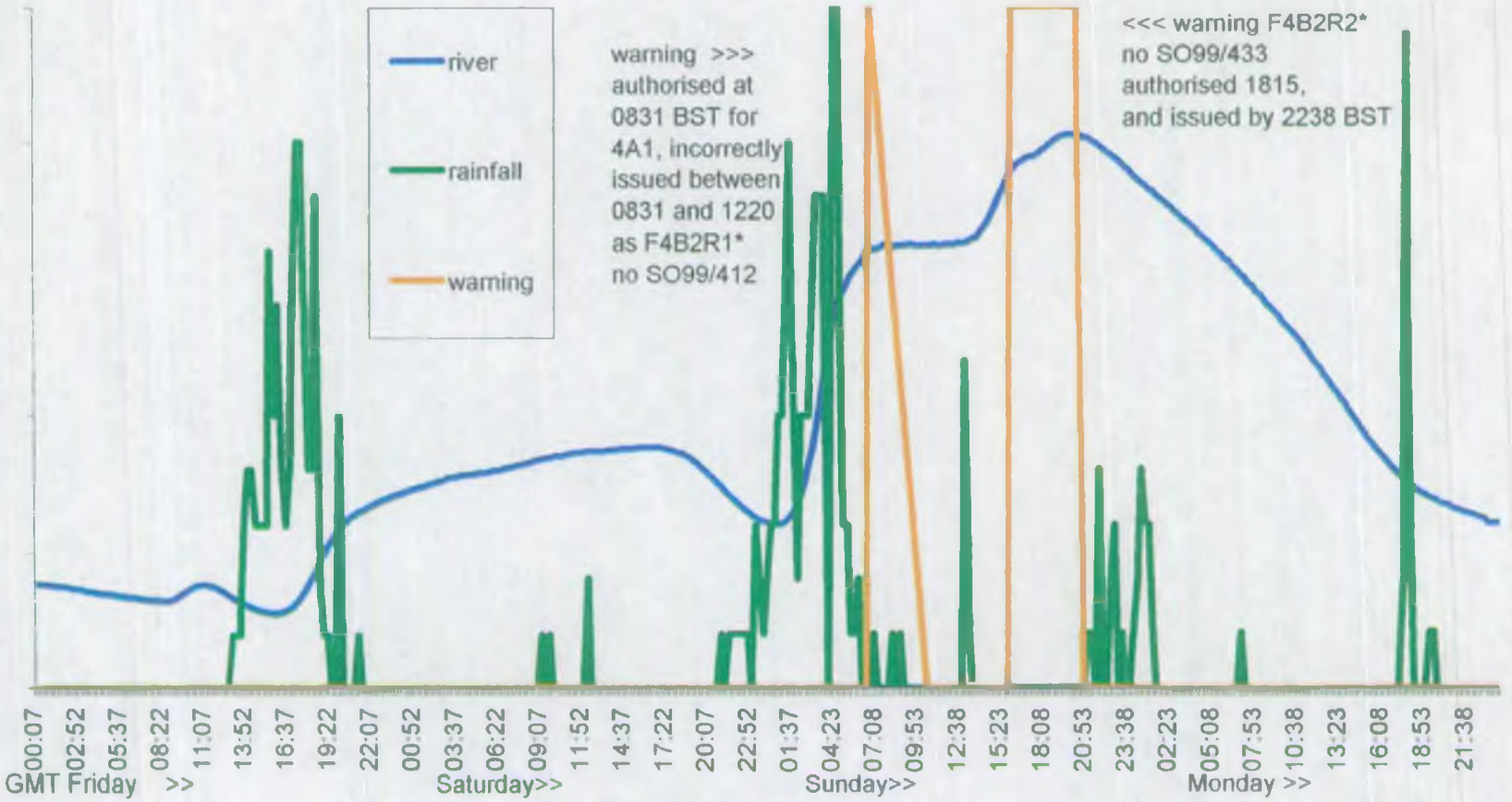
Sources: Popeswood rain gauge, Barcombe d/s River flow, 26-29 May 2000



River flow, rainfall, and warning data for River Cuckmere (4B2)

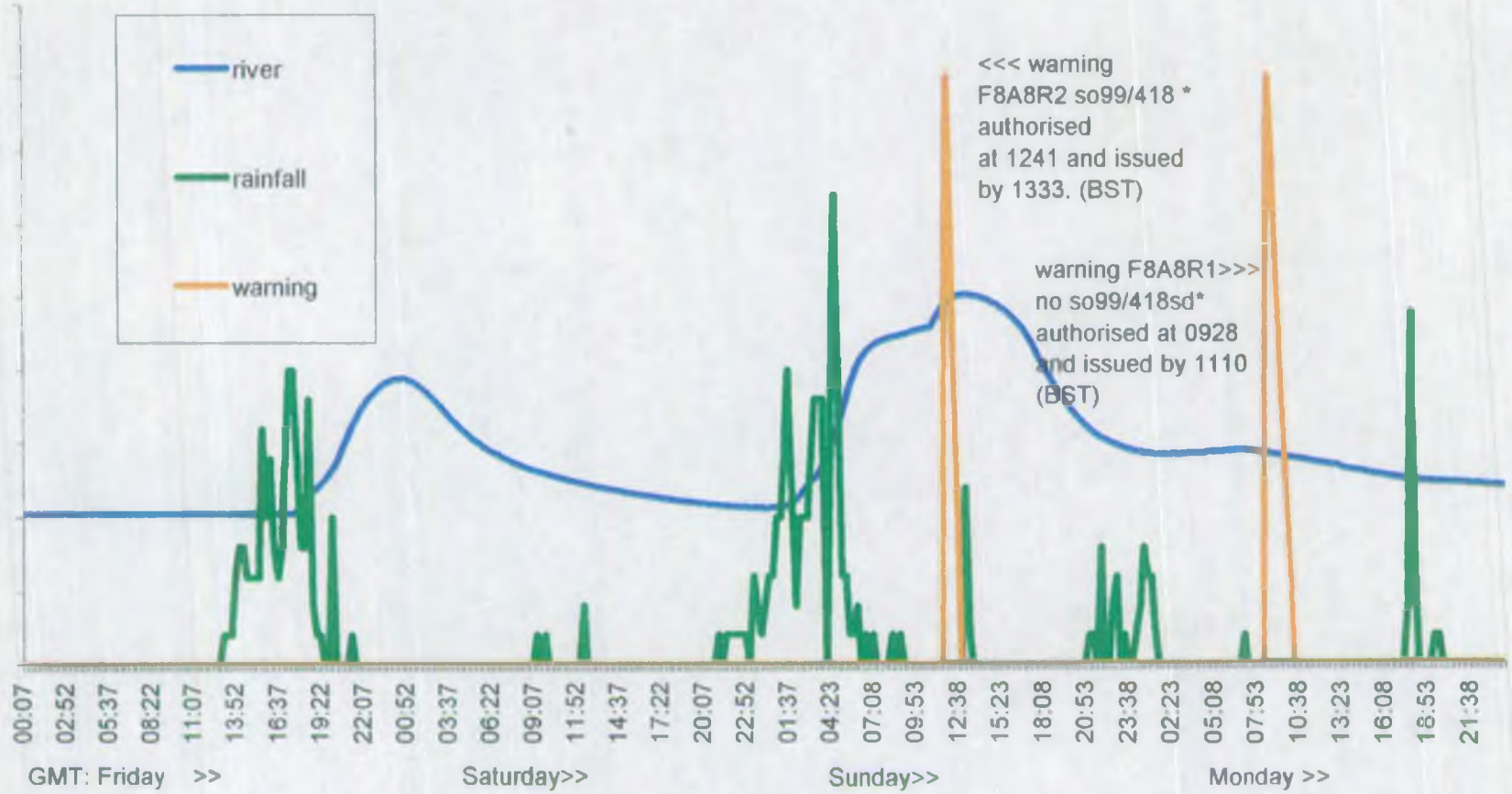
Sources: Cowbeech Rain Gauge, Sherman's Bridge River Level

This chart shows one pair of warnings authorised for 4A1 (Uck) but issued wrongly for 4B2, and one pair issued correctly for



River flow, rainfall, and warning data for River Teise (F8A8)

Source: Lamberhurst rain gauge an d River Level, 26-29 May



River flow, rainfall, and warning data for River Beult (F8A9)

Sources: Rain gauge at Sutton Valence , River Level at Smarden, 26-29 May 2020