DRAFT REPORT

REVIEW OF NRA REGIONAL EMERGENCY PROCEDURES

(Continuation)

SEVERN-TRENT REGION

1. INTRODUCTION

1.1 Severn-Trent Region is the second largest NRA Region covering an area of 8,000 sq miles and with a population of 8.25 million.

1.2 The Region has been divided on a catchment basis with four areas of roughly equal size, achieved by dividing the Severn catchment at the confluence of the Severn and Teme and the Trent catchment as the Trent-Dove confluence. The four areas are: Lower Severn based at Twekesbury, Upper Severn based at Shrewsbury, Lower Trent based at Nottingham (South) and Gainsborough (North), and Upper Trent based at Fradleigh. The Head Office is at Solihull with a sub-office at Alton Court. Within each area there are smaller sub-offices and depots.

1.3 Management is simplified and essentially catchment area based. The General Manager is supported by five functional managers responsible for catchment management; Environmental Quality, Fisheries, Conservation and Recreation; Flood Defence; and Finance and Administration. At area level there is no general manager but the Catchment Area Manager has additional overall administrative duties.

1.4 Within the areas, departmental boundaries have been established based on 'demand' rather than for reasons of symmetry or 'neatness'. Although this is not significant in the case of flood defence, boundary anomalies, similar to those which exist in Thames Region, have been created between fisheries and pollution staff. Unlike Thames Region, however, this Region has resolved the problems associated with anomalous boundaries (complicated call out and standby systems, confusion over responsibilities, and confusion over passages of information) by entirely 'patching' responsibilities. In other words, a Fisheries Officer is

responsible for a particular reach of river just as a pollution officer is responsible for a particular 'patch' within an area. In this manner Regional Control Room staff as well as area staff know precisely whom to contact, and field staff know their immediate counterparts in the area. That responsibilities are 'patched' does not entail that officers work exclusively in their patch - cooperative assistance is available in the usual manner.

1.5 Severn-Trent is a busy Region. There are 6,191 km of watercourses and canals, including 3,560 km of main river for flood defence, 821 km of constructed fisheries. There were over 6000 pollution incidents recorded for the year ending May 1991 including 65 category 1 (notifiable to Head Office under the Emergency Liaison Arrangements), and 2,682 category 2. The majority of the serious incidents were based on industrial chemicals, oils and related products and sewage works, reflecting the dominating role of the Birmingham conurbation in the Region. Fisheries staff assist in a small proportion of these incidents. Flooding incidents can be particularly destructive and more than 30,000 properties and 400 sq km of agricultural land are protected by flood defences. These include 27 miles of hard flood defence walls, 495 miles of soft flood defence earth embankment, 33 pumping stations to drain the land, 428 sluices, and 7 flood defence storage lakes.

2. PERSONNEL ARRANGEMENTS

2.1 Severn-Trent maintain an Emergency Planning and Communications Officer, an assistant, five control room staff and a rota of telephone operators.

2.2 The former has 12 years experience in emergency planning and this has benefited the Region. The Emergency Planning and Communications Officer is responsible for the maintenance of general emergency procedures, the overall of specialist emergency procedures, communications and security, and management of the control room staff. He reports to the Services Manager, an advantageous arrangement in comparison with other regions. The implications of this

management structure are discussed in Section 8. Financial.

2.3 The assistant is responsible for the day to day management of the Control Room and cellnet system and assists the Emergency Officer in general duties. The Control Room and telephone exchange functions have been joined with one controller and one telephone operator on duty during the day, and with one controller on duty at night. This is unique to Severn Trent and is commended - incoming public calls can be passed without delay (the two operators sit side by side), and staff can assist each other during periods of heavy traffic. The responsibilities of the duty controllers include operating the switchboard, monitored telemetry systems, maintenance of the call out rosters and procedures, operating and responding to the alarm systems, and operating the communications systems.

2.4 Pollution Control maintain a system of on duty and on standby officers on a 24 hour basis. Reports of pollution incidents may be received either at area offices (more common during work hours) or at the Control Room, during out of office hours. Incidents are logged manually - in the case of major incidents the area office will pass a verbal message by telephone to the Control Room and support it with a faxed formal daily incident report. This procedure allows Control Room staff to remain informed of all the significant incidents which are occurring in the Region during the day and is particularly significant in the period of transition between work and silent hours, when Control Room staff may be required to take over support for field staff.

2.5 Once logged, the Duty Area Officer will pass the incident to the relevant Field Officer who specialises on that patch. During out of office hours, the Control Room inform a duty standby officer who subsequently calls out the relevant officer or who deals with the incident himself. This apparently redundant system has the advantage of securing at least one officer who is available in any circumstances and who then has the responsibility to ensure that the incident will be investigated. In the event that the incident develops, during work or silent hours, the Field Officer will inform the Senior Pollution Control Officer who is then responsible

for the management of the incident. Duties may include organising internal as well as external assistance, keeping the regional office informed, and informing the PR department. The Senior Pollution Officer may choose to open an Incident Room at area level but this option is seldom exercised. In the event of an emergency, the Head of Pollution Control, the EQ Manager, and the Duty Manager would be informed. These would be primarily responsible for liaising with National Office.

2.6 Fisheries do not maintain a duty officer (there is no requirement as the Area Pollution Duty Officer effectively fulfils this role) but all officers are on standby and each Fisheries Officer has responsibility for a patch. If the incident requires additional manpower, inter-area assistance is available. Significant incidents are made known to the Area Fisheries Officer who is responsible for informing the Regional Control Room, Regional Fisheries Office and the PR office. During out of work hours when the Area Fisheries Officer is not available, staff are required to log on and off through the Control Room who also are available to provide any necessary support (a daytime answerphone log on-off system at area level is also available). Two points are worth making: liaison between pollution and fisheries is close, and the importance of PR is not under-estimated (indeed fish rescues were described as a 'PR event'). Further, flood defence staff may also be made available to provide ancillary work, another example of inter-departmental cooperation. When the incident is closed, a written report is submitted to the regional office and one copy is retained at area level.

2.7 Flood warning and flood defence personnel arrangements are complementary and are based on duty Area Warning and Duty Area Operations Officers. The service operates on the basis that forecasts are issued by the Regional Forecasting Duty Officer (RFDO) to the Area Flood Warning Duty Officer (AFWDO) who then issues a verbal warning to the Police, Control Room (responsible for issuing the formal faxed warning) and Area Operations Duty Officer. At this stage, the Area Flood Warning Duty Officer may also inform regional management and the local media. The Control Room remains responsible for informing police, the general public, flood wardens, local authorities, British Rail, Pollution and Fisheries staff

and regional PR, effectively dividing reporting responsibilities. The Area Warning Duty Officer remains responsible for the mobilisation of resources and operators within the area. These would include the supervisors and gangs, and might include contract labour, local authority and Army. Overall, there has been a well considered rationalisation of duties and passages of communication to provide the most efficient service.

2.8 Lastly, Severn-Trent maintain a Regional Duty Manager roster. The Duty Manager provides a 24 hour watching brief on the Region's Operational activities and may act in a coordinating roles in incidents affecting more than one area, as a means of communication between areas, regional management and Government departments as required.

3. PROCEDURES

3.1 Severn-Trent maintain a general Emergency Procedures Guidelines, which is updated by the Emergencies Officer, as well as several specialist emergency manuals.

3.2 The Emergency Procedures Guidelines covers in general terms the actions and responses in the event of pollution, oil pipeline emergencies, radioactivity incidents, animals diseases, flooding, rivers defences and droughts. In a system similar to that used by Wessex Region, all emergencies can be summarised under three principal headings: the Emergency Controller, the Flood Controller and the first person at the scene.

3.3 The Emergency Controller is usually the most Senior Area Officer of the function involved and is responsible for providing support services to field staff, for mobilising resources, both regional and external and directing the activities in the incident room. An incident room may be opened at the discretion of the Area Officer to provide 24 hour support for the field staff. The Field Controller is usually a senior member of the staff involved who is responsible for the direction

and deployment of staff and resources at the scene. The first person at the scene is the initial member of staff to visit and assess the incident. A second general manual - The Operating and Procedures Manual - is also maintained, for the of Control Room staff. This manual contains advised actions to cover a variety of eventualities, listed in alphabetical order.

3.4 Pollution emergency procedures are kept both in the Emergencies Procedures Guidelines and in an EQ Emergencies Manual. There is no manual for fisheries emergencies (none is required) but health and safety guidelines are provided to cover the risks undertaken by staff dealing with poachers.

3.5 By far the most comprehensive manuals are those covering the flood warning and flood defence emergency procedures. Each area has dedicated emergency procedures which reflect in detail the local conditions. Flood warning manuals have been written with the benefit of 'Streamline' and are extremely comprehensive (the extensive floods in the Twekesbury and Gloucester areas in 190 were accurately forecast). However accurate the forecasts, it remains largely a police responsibility to ensure that the warnings reach all potential households. Severn-Trent commissioned a study by Middlesex Polytechnic to ascertain the success of the dissemination of warnings. The study concluded that both the timeliness and dissemination were found wanting. In order to improve the situation, a flood warden system will be introduced throughout the Region (the system has in fact been operating successfully in three counties for a number of years). Members of the public act as senior wardens responsible for initiating a 'cascade' to threatening households. The wardens subsequently become a point of contact for the flood defence staff and are able to pass back information on the developing flood. This system is recommended as an effective method of alleviating the burden on police and local authorities whose overstretched resources often results in a poor service to threatened communities.

3.6 In addition to the area flood warning manuals, a separate threshold manual has been introduced in which the calculated yellow/red/amber levels are given for each gauged location, in a user-friendly format. It is intended that this information will

be stored electronically in the future.

3.7 The Area Flood Defence manuals are equally comprehensive. For each reach of any designated main river, an exact sequence of actions has been formalised. This includes who is responsible for doing what, how he can be contacted, and when he must carry out the required actions. Location plans and other miscellaneous information are included. Effectively, the elements of chance and error have been as far as possible, taken out, and replaced by exact proceedures. No contingency plans, however, currently exists for unforeseen events (such as breech collapses) and this is being addressed.

3.8 During flooding events procedures are implemented to carefully monitor the progress of the flood. Flood Defence manuals and specialists monitor threatened areas and record in detail observed rises in water levels, press reports are collected, aerial photographs are taken, and officers poll affected areas. The collated data is recorded on an IBM PC and is subsequently used for analyses, studies and development control.

3.9 Together with 'Streamline', Severn Trent have used the 'One in Ten Year' flood criteria, to produce these comprehensive manuals. Assuming one major flood in ten years, for vulnerable reaches, flood defence staff have precisely identified the manpower, equipment and financial requirements to cope with the emergency. This criteria has been used to calculate a figure of 241 required staff (taking into account such variables as sickness and leave) to cope with flood emergencies.

3.10 Overall, Severn Trent's flood warning and flood defence manuals are of a very high standard and could serve as useful models for other regions.

3.11 One last point is worth noting. Severn Trent have established an incident caravan based centrally in Fradleigh. The caravan has communication and office facilities, and a duty driver. Although the caravan is yet to be used, it is intended that the vehicle will become a ready incident control point in the event of a major emergency.

4. EMERGENCY CONTROL FACILITIES

4.1 Severn-Trent Region run a joint Control Room and telephone exchange, manned on a 24 hour basis, as well as a flow forecasting room. The latter is not manned permanently (the sophisticated characteristics of the 'Streamline' flood forecasting system have rendered permanent manning obsolete).

4.2 The Control Room is comparatively simple (there is no radio network and 'Streamline' has simplified functions).

4.3 Telemetry (rain gauges, river levels and flows, intruder alarms, fire alarms) are monitored on a single VDU which has an alarm and print out facilities. Effectively, the Control Room is a 'remote user' of 'Streamline'. As remote users, control staff can monitor region wide telemetry and provide data for other departments in out of office hours. However, with 60 such VDUs in the Region, there is considerable redundancy and departments can access their own data requirements.

4.4 A second VDU is used to monitor national weather conditions. Contact lists and cellphone lists are also maintained.

4.5 There is only one ex-directory telephone and this is assessed or adequate. There is no freephone for public calls, and no electronic logging of incidents. The former is being held until a decision is taken on whether to issue a national freephone number. Electronic logging (such as the system used by Wessex Region) may be introduced later in the year. Currently, public calls are logged manually and passed to areas by telephone, supported by a faxed message.

4.6 Severn-Trent also run a 'Riversline' from the Control Room, based on an (0898) number. Fisheries information is extracted on a daily basis and is stored on a cassette tape. The system is reported as very popular with anglers and, further, is financially renumerative. The 'Riversline' is also used to issue flood warnings.

The Control Room maintain a full range of emergency logs. These include an alarm log, a cellphone log, a contacts and rosters log, and a fisheries log (used for logging personnel on duty during out of work hours, for which the NRA has vicarious responsibility). Emergency manuals include a Flood Warning Manual, an EQ Emergency Manual, and a General Operating and Procedures Manual. The latter contains a general compendium of instructions to cover a wide range of eventualities, listed in alphabetical order. This document is particularly useful and a sample of the contents list gives an indication of its comprehensive nature: bomb threats, fax faults, radioactive source incidents, and Sapphire East - fire alarms.

4.7 Lastly, the Emergencies Assistant maintains an archive of logged incidents, local authority emergency plans, police plans, CIMAH site plans, and a newly introduced compendium of high risk sites.

4.8 Overall, the Severn-Trent Control Room is both well run and equipped and in comparison with some other Regional Control Rooms, functionally simplified.

4.9 The flow forecasting room houses the 'Streamline' system and is used by hydrology staff who are subordinated to the Water Resources Department. While the flow forecasting room provides a regional forecasting centre, flood warning is the responsibility of the area level flood warning staff. This arrangement is unique to Severn Trent and is justified for two principal reasons: regional hydrologists have other duties other than flood forecasting and, second, the local experience offered by the area offices is assessed as invaluable. It is emphasised that both forecasters and duty flood warning officers have access to 'Streamline' (although only hydrologists have access to the full range of functions) and decisions to issue flood warnings are arrived jointly. It should also be noted that the provision of lap top computers allows hydrologists and area officers to monitor conditions from home and this is more often than not the preferred method of work. In the event of flooding, however, area officers would operate from area offices. The decision to issue a warning is taken by the area officers but the warning itself is sent by facsimile from the Regional Control Room. A verbal warning by telephone is also

sent by the area officer. Information is also passed to the public using the Control Room 'Riversline' and through a network of answerphones at area levels. Both these systems are recommended.

4.10 Severn-Trent provide a 4 hour warning service (anything less is considered unrealistic and would entail sacrificing accuracy). No flood warning service is provided either for small tributaries or for flash floods. This service could be provided but only at significant cost and is not assessed as worthwhile.

4.11 The centrepiece of the flood warning system is 'Streamline', a highly sophisticated automated, real-time, flow forecasting system. The system has five principal components: a network of 250 outstations; the master station for data collection; forecasting models; 'Remus' or the remote user data and forecast presentation system; and an alarm monitoring facility.

4.12 There are 250 outstations which monitor rainfall, river levels and flow, reservoir levels, air temperature, windspeed, snow conditions as well as other water quality determinants throughout the Region. As well as logging data for interrogation at random intervals over standard BT PSTN lines, outstations continuously monitor high and low levels to raise alarms at the master station. This data is combined with telemetry data and weather radar data without any need for operator intervention. Data collection can be at predetermined time intervals, on manual request, or on receipt of an alarm.

4.13 The master station has four principal functions: control of user interactions, data collection, alarm and forecast generation, and transmission of data to remote users. Data collection from all 250 stations can be achieved in under 15 minutes and radar images and hourly catchment rainfall totals measured by the Clee Hill and Lincoln radars which are assessed as invaluable, particularly to remote users. Integrated flow modelling can be achieved in 3 minutes for each basin, using hydrological models applied to predict flows at 5 locations. Forecasts can be up to 5 days ahead. The capability to respond to alarms and to generate alarms based on forecasts is fully automatic.

4.14 Remote users on the 'Remus' system can access information on weather radar images, weather radar rainfall measurements, rain gauge , rainfall measurements, and river forecast hydrographs. This allows personalised display in a user-friendly format.

4.15 Finally, there is an alarm monitoring and response facility. This facility allows a wide response of remotely generated alarms to be displayed, with advised actions, in the Control Room. These can then be re-transmitted to duty officers who can initiate outstation polling.

4.16 The benefit of 'Streamline' are summarised as follows: improved advance warning times, minimised running costs, operational flexibility, improved access, automatic alarm notification in spoken form, integrated weather radar data, extensive activity and event logging and high quality presentation of forecast products.

5. COMMUNICATIONS

5.1 Severn-Trent Region have no radio network and reported no future plans for such a network.

5.2 An extensive cellnet network has been established in its stead with over 400 users. Vodaphone is used in some eastern areas where cellnet users have experienced communication difficulties. Limited use is made of UHF short-range portable radios.

5.3 In order to cut the usually prohibitive costs of cellnet, a direct link has been negotiated which reduces the costs of operating the system by about one third. Direct link will also be negotiated for vodaphone and is expected to be in place by the end of the year.

5.4 Severn-Trent report favourably on this system and do not assess as necessary the redundancy offered by a back-up radio network. The Region's comments, as

second largest and possibly the busiest, are illuminating. In other regions which operate both a radio and cellnet equivalent system (usually vodaphone) it is almost invariably the case that field operators prefer and mostly use the vodaphone rather than radio (exceptions include unique cases such as the Thames Navigation Division, operators in areas which experience difficulties with vodaphones, and departments which do not have an adequate complement of vodaphone). The trend nevertheless is clear - if vodaphone or cellnet are offered, operators stop using radio.

6. EQUIPMENT

6.1 Severn-Trent Region maintain 23 depots which range from caravan size to large maintenance hangars. The depots are so located to provide a half hour service to any part of the Region. In addition to these, equipment and stocks are held in area offices and these would be available in the event of an emergency. Schedules of emergency plant and equipment are maintained.

6.2 Support contract arrangements are in place in the event of an emergency which requires significant logistic backup. These have been selected on the basis of reliability and availability, and more than one contractor is available giving redundancy. To further enhance the system, flood defence have an emergency roster for the call out of contractors with capabilities to assist with the flood defence infrastructure.

6.3 No outstanding equipment deficits were reported by any department which would affect the response to emergencies.

7. EXERCISES

7.1 Severn-Trent run regular exercises, both 'real-time' and 'paper' exercises. These are run on the insistence of the Emergencies Officer and generally are not

welcomed by staff ('We haven't got time for exercises!'). Nonetheless, the exercises are used to test specific actions at particularly vulnerable areas and sites, and valuable lessons are learnt. The importance of 'selling' the exercise remains a clear lesson from the Severn-Trent experience and this is best achieved by having a worthwhile, specific aim. The selection of particularly vulnerable sites and the exercising of specific contingency plans is a good example of how this might be achieved.

7.2 In addition, joint exercises are held with local authorities and with private concerns (the British Pipeline Association is noticeably active in this respect, in several NRA Regions).

7.3 Lastly, Severn Trent plan to hold a 'Raynet' exercise simulating a total communications breakdown. This is a contingency exercise which is recommended to other regions.

7.4 In addition to exercises, Severn Trent hold numerous seminars. These are run by the Emergencies Officer and the external agencies involved include MAFF, the Police, the Fire Brigade, and the British Pipeline Association. Seminars between NRA departments are held during induction courses. The Emergencies Officer continues the process of 'education' by giving frequent talks to departments to remind of them of the importance of using correct procedures. These talks are assessed as a valuable way of encouraging uniformity and efficiency amongst widespread staff.

7.5 Lastly, regular annual meetings are held with the emergency services. These are assessed as a valuable way of explaining the powers and duties of NRA staff in the event of emergencies.

8. FINANCE

8.1 Severn Trent have established a unique and recommended financial arrangement

for the emergencies function.

8.2 The Emergencies Officer and staff are subordinate to the Services Manager whose other subordinations include the Regional Accountant and Regional Solicitor. The Control Room charge a precept on the budgets to which a service is being provided, in other words, flood defence, pollution and fisheries. In this manner, the Emergencies Officer not only enjoys financial independence but is most importantly independent of the departments who deal with emergencies. He remains a neutral figure who can be seen to offer advice and assistance with impartiality, and he can influence and change policies or procedures without having recourse to a manager who may be unwilling to support him, or who considers him 'personal property'! The status of the Severn-Trent Emergencies Officer is one of the contributors to the many successful ideas which have been introduced and is recommended to other Regions.

8.3 Second, Severn Trent run a formal system for unforeseen expenditures such as those incurred in emergency situations. If additional expenditures are required, the Area Officer may spend up to a certain pre-determined sum by requesting an emergency code held in the Control Room. If the expenditure is likely to rise beyond this level, authority is sought from the Regional General Manager during office hours, or from the Duty General Manager during out of office hours. This system is also recommended.

9. CONCLUSION

9.1 Severn Trent Region run 'a tight ship'. Regional pride, a sense of professionalism, and a 'best possible service' ethos are evident. Indeed, Severn Trent offers a good model on the efficient management of a large and busy region. Underlying this efficiency is a formalised system of well considered procedures and duty personnel from the topmost tier (the Duty Manager roster) to field level. The Emergencies Officer and Control Room are integral to these and must take credit.

9.2 The 'show piece' of the Region is undoubtedly the 'Streamline' flow forecasting and flood warning system, and flood defence operations. Severn Trent possibly run the most comprehensive flood warning and flood defence service in the NRA and many valuable lessons may be learnt from their experience in this field.

9.3 Overall, the Region displays a confident sense of professionalism and integration which is soundly based on efficient management practices and well considered procedures.

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THAMES REGION

1. INTRODUCTION

1.1 Thames Region covers an area of about 5000 sq miles and has a resident population of about 11 million. There are 55 local authorities in the region including those of the national capital. The Region includes 5,294 km of main river of which 217 km are part of the navigable Thames. The Thames Barrier is included in the Region but is operationally independent.

1.2 The Region is effectively one large catchment of the River Thames and this has resulted in a functional rather than geographical division of the Region. For historical reasons each of the principal functions then divided themselves independently into areas and districts, with the result that boundaries are not always concurrent and Thames Region is more an amorphous rather than homogeneous organisation. This compares with other regions which are based on a head office - catchment areas model, where each of the functions is integrated to the catchment area offices in an essentially pyramidical structure of management.

1.3 A description of these divisions illustrates the point. The flood warning and river control is under the river information and control group and is responsible for providing the fluvial flood warning service, for ensuring that statutory levels are maintained on the non-tidal River Thames, and for tidal flood warnings and tidal control. This function is divided geographically into the Thames Valley flood warning area based at Reading, and the Eastern flood warning area (encompassing Lee and London) based at Waltham Cross. There is also the tidal Thames area based on the Thames Barrier. Flood defence and land drainage, a function which complements the warning service, is divided differently - there is an upper Thames area based at Oxford, a lower Thames area based at Sunbury, a Lee area based at Ware, and a tidal Thames area.

1.4 The Environmental Quality Department, responsible for pollution incidents and water quality is different again - there are three areas, each sub-divided into two districts. These include West area (Oxford and Reading districts), North-East area (Waltham Cross and Amersham districts), and South East area (Guildford and Crossness districts).

1.5 Lastly, Fisheries are divided into two areas West and East areas, based at Guildford and Waltham Cross respectively.

1.6 The practical implications of anomalous boundaries are several. Communication lines, contact lists, and reporting procedures are almost inevitably more Second, loopholes can develop between areas which share anomalous boundaries. An example was cited by the Fisheries Department in which a Water Quality district might assume that the relevant information was being passed to a fisheries officer by the adjacent Water Quality District, resulting in neither informing Fisheries.

1.7 There are also broader implications. Amorphous organisations encourage semi-autonomy from the various departments. Whereas there are positive benefits from this degree of independence (districts can 'get on with it', without central interference), there are also negative aspects - the centre can 'lose touch' with the day to day business, to everyone's disadvantage in the long term. This point is laboured because Thames Region is different to the other regions which have rationalised their functional and geographical divisions and operate comparatively simpler and more integrated procedures - crisis or emergency management is clearly simplified if the organisation itself is functionally and geographically rationalised.

1.8 Flooding emergencies are generally a rare occurrence in the Region. Pollution incidents are more common with 3,573 incidents investigated last year. Fisheries were involved in 'less than 100' serious incidents, including 23 emergency rescues and 30 planned rescues.

2. PERSONNEL ARRANGEMENTS

2.1 Thames Region have a newly appointed Emergency Planning Officer who is responsible to the River Information and Control Manager.

2.2 The officer's responsibilities include the maintenance and preparation of emergency plans, management of the communications centre, assisting specialist managers and monitoring emergency procedures manuals and miscellaneous manuals (the "Who does What"), and liaison with outside agencies. The Emergencies Officer is also secretary to the Emergency Planning Forum. Overall, the officer is relevantly placed in the management structure and has 'real' responsibilities.

2.3 The communications centre is manned on a 24-hour basis and has a staff of five controllers. There is no daytime senior controller. Staff are primarily communicators but also assist in the monitoring of telemetry and recording of incidents. Unlike some other Regions, Thames does not use an electronic logging system in the communications room (although the Environmental Quality Department have independently introduced such a system), and public calls have first to be recorded by hand and then sent by facsimile to the relevant district or area.

2.4 A major reported problem is the now outdated mainframe links in the computer system. These have led to overload or to slow and inefficient responses. This has encouraged functional and geographical autonomy as departments have had to find solutions to their data storage and transmission problems without recourse to the Regional Communications Centre. Independent systems are now in place and it would require a sophisticated IT system to overcome the resistance that any proposed changes would almost inevitably incur. Nonetheless a centralised 'all informed' IT network does offer advantages, particularly in the event of emergencies where anticipation is important, and where departments become 'news hungry'.

2.5 The flood warning function is managed from Flood Control Rooms: the Reading or Western Area Flood Room is responsible for all catchments up to Teddington Lock, and the Waltham Cross or Eastern Area Flood Room is responsible for all catchments downstream of Teddington Lock. Both Flood Rooms are manned on a 24 hour basis using simple but slightly varied systems of duty officers. Reading operates with two duty Flood Controllers during office hours who have telemetry monitoring equipment at home, and one Flood Duty Officer during out of office hours. The Communications Centre controllers also monitor telemetry so there is redundancy in the system. Waltham Cross operates with a rota provided by four Flood Duty Officers/Assistants and four Technical Support Officers. Warnings in both cases are sent by telex to the relevant police force.

2.6 The Thames Barrier Control Room remains an operationally independent unit.

2.7 The Flood Defence and Land Drainage function has flood defence, engineer and operational engineer departments. In the event of a flood warning, the relevant area duty officer is informed and he is responsible for logging the incident. The overall operational management of the incident remains with the area manager, field control is with the relevant engineering officer. Flood Defence staff expect a 2-4 hour warning period. In practice this lead period can be much longer on the upper reaches of the Thames and much shorter in the metropolitan area. The Flood Defence manager at regional level is kept informed but does not ordinarily exercise operational control. Throughout the flooding, defence staff provide updates to the Flood Control Room who in turn provide telemetry data to staff on the ground. An incident room at operational level may be established depending on the duration of the flooding. These personnel arrangements are also used in the event of other types of emergencies (such as lock failures).

2.8 Flood Defence staff do assist both flood staff from other areas and other departments (principally Environmental Quality). In the latter instance, Flood Defence staff may be required to assist in a potentially toxic environment (this was cited as an example), without proper training or protective equipments. That this is the case on a routine basis suggests that in the event of an emergency, staff

might be committed without due regard to health and safety considerations. Special training courses, exercises and seminars were suggested to resolve this situation.

2.9 Pollution incidents are handled at district level by a District Duty Pollution Controller. During out of office hours there is an area Duty Pollution Officer on standby. The duty officers are responsible for logging the incident (described more fully in Section 3. Procedures), and for informing the relevant pollution officer to attend the incident. If the incident appears significant, the Pollution Control Manager at regional level would be informed by facsimile. This procedure is welcomed as means of ensuring that emergencies are made known to senior regional management at the earliest instance. However, there appears to be no parallel procedural arrangement for informing the PR office and this is seen as a weakness. Area Groundwater Protection Officers and Water Supply Undertakers may also be informed if their interests are involved.

2.10 In the event of a serious incident, the Environmental Quality Area Manager working with the Principal Pollution Officer, become responsible for informing the regional headquarters and for receiving and disseminating updates to PR, and for liaison with other NRA departments. Very rarely does an incident become so serious that operational control would be passed to Regional Headquarters. Procedures for this eventuality as well as the other cases are established in the Environmental Quality Emergency Procedures Manual.

2.11 The Fisheries Department (in common with other regions) has the least formalised personnel arrangements. Incoming calls may be received from a variety of sources, the Regional Communications Centre, angling clubs, riparian owners, and from the general public. There is no standby system, and no 'patch' system - the area field officer receives the call, day or night, in the office, at home, or in the field, and he has a staff of two Fisheries Officers, one Assistant Fisheries officer and one Fisheries Assistant, all effectively on call out, to deal with the incident. Officers may work cross-boundaries. The system reportedly 'works', but some problems were reported. These reflect boundary and reporting issues

examined elsewhere and do have implications in the event of emergency: pollution staff do not always report small mortalities to fisheries and, on occasions, fisheries are not made aware of incidents which would be of interest to them. The Daily Report system used by Wessex Region is a good example of how a region can be kept 'all informed' on a daily basis, by each department submitting a brief summary of significant events which are then published and disseminated throughout the region.

3. PROCEDURES

3.1 Thames Region maintain several emergencies procedures manuals. These are being revised by the Emergency Officer to a high standard. The impetus for this process has been provided by the Quarterly Emergency Planning Forum, a practice unique to Thames, which is commended to other regions.

3.2 The Forum has identified all contingencies likely to require an emergency response and these have been placed in sixteen categories. These categories deserve to be quoted in full as an example of comprehensive contingency planning. They are: fluvial flooding; tidal flooding and defences failure; pollution incidents; radioactivity; pipeline incidents; CIMAH site incidents; construction sites and river structures including reach draining; flood defence dams and reservoirs; departmental responses to flood defence emergencies; drought, accidents on the non-tidal Thames; loss of corporate facilities including the telephone exchange and computers; industrial action; major civil emergencies; civil defence, and terrorism.

3.3 Against each of these categories Thames have asked the following questions in tabular form: what is the likelihood of the occurrence? Is there a published plan? Is the plan adequate? What is the awareness of NRA staff lead departments to the procedures? What is the awareness of NRA staff 'support' departments to the NRA role? What is the awareness of external organisations to the NRA role? What is the adequacy of the public relations response and what are the priorities, preparation requirements and subsequent maintenance efforts for the contingency

plans?

3.4 This is quoted in full, it is reiterated, as an example of a comprehensive identification of likely contingencies. The Forum has identified those procedures which require immediate revision or in some instances, initial publication, and the Emergencies Officer has been tasked with producing drafts.

3.5 Two other points are worth noting. With such a large number of local authorities in the Region, it has become impractical to hold all local authority emergency plans. These are being replaced with a straight forward exchange of contact information accompanied by a brief statement of the general and emergency responsibilities of each organisation. This information will form a local authorities contacts digest and is recommended to other regions.

3.6 Second, the Emergencies Officer has produced a "Who Does What" document (essentially key contacts organised by functional and geographical divisions) which is commended as a simple, user-friendly document.

3.7 The overall drive behind all these initiatives is a welcome honesty exemplified by this quote from the Emergency Planning Forum Report: "A number of formal and informal procedures exist in the Region, but these are by no means comprehensive enough as was demonstrated by the 'Teddington incident'".

3.8 Reporting procedures vary from department to department. As a general comment, departments tend to be comparatively insular.

3.9 Pollution incidents are reported either to the Communications Centre or area offices. In the former case, the details of the incident are recorded manually on a standard format and are subsequently sent by facsimile to the relevant area (this contrasts with automatic, electronic logging systems which, for example, is operated in Wessex). In the latter case, an 'incident reporting system', based on stand alone PCs has been devised. The data is recorded using a system of category boxes similar to the 'PILS' (Pollution Incident Logging System) used in

South West Region. A hard copy is sent in the case of category 1 and 2 incidents to the Regional Headquarters. In addition, the monthly data containing all incidents is received by the Headquarters for the compilation of monthly statistics. The system was jealously described as "the best in the NRA". The system is good but does not enjoy the benefits of integration with the Communications Centre and with other departments which some other Regions have exploited. In the case of significant incidents and emergencies, for example, communications between area and Headquarters would be either verbal over a telephone, or by facsimile.

3.9 Fisheries do not use an electronic reporting system and no requirement for such a system was perceived. In the event of a significant event, the responsible Fisheries Officer would submit a written report on a non-standardised format. Debriefing, similarly, is undertaken on an informal basis. One result of the apparent insularity of the fisheries department is the reported poor relationship with the PR office. In a Region which could successfully exploit 'positive PR' (such as a significant fish rescue) and gain positive news coverage, this is regrettable.

4. EMERGENCY CONTROL FACILITIES

4.1 Thames Region operate three separate rooms for incident and emergency handling, at regional level. These include the Regional Communications Centre, the Flood Control Room, and the 'Argus' room (so-called because it contains the 'Argus' computer banks) which can be converted quickly into an incident room. In addition, Eastern Region have a Flood Control Room at Waltham Cross. The Thames Barrier Control Room is a communications facility in its own right.

4.2 The Regional Communications Centre handles region-wide communications, monitors telemetry and provides a database for officers operating in the field. Aspects of the communications network are examined in section 5. Communications.

4.3 Telemetry is monitored using 'Argus' (the system's hardware brand name), through alarm telephones and manually. Controllers monitor the system and pass information either to the Flood Control Room or to other officers on the ground. The system has redundancy as it is duplicated at Flood Control and officers can monitor the system from home. 'Argus' has an incorporated alarm system but it not 'intelligent' or 'self-interrogating'. In any case, telemetry is routinely interrogated twice a day, and four times a day in case of flooding, in the Flood Control Rooms. The system was described as effective but not user-friendly. The alarm telephone monitors flood defence alarms.

4.4 The Communications Centre also provides a ready database for officers in the field. Detailed information is held on districts and towns within the Thames Region as well as other miscellaneous information. A register of some of the 34,000 craft on the Thames (this information is particularly required by navigation staff) is also held in microfiche.

4.5 Lastly, the Communications Room receives meteorological data. Weather forecasts are received on a weekly basis on Thursdays to cover the weekend period, by telex, from the National Meteorological service. Supplementary storm warnings are received automatically by facsimile. In comparison with other regional centres, Thames does not receive a daily weather forecast but this service is not perceived as necessary as flood control monitor meteorological conditions in detail. The Thursday weather forecast is used to produce a detailed 'catchment assessment' for the weekend period which includes such information as the catchment saturation at various points, the Thames natural flow rates, and reservoir storage capacities.

4.6 The Flood Control Room has a dual role. During routine periods it is responsible for monitoring catchment water levels, effectively balancing water abstraction demands with navigation demands on the Thames. The 45 locks and 133 weir structures are integral to this role. The Flood Control Room additionally monitors rainfall (there are over 350 rain gauges) and river flows. When conditions suggests a likelihood of flooding, warnings are issued to the police.

4.7 Telemetry is monitored on the 'Argus' system, in a duplicate of the system held in the Communications Centre. Around half of the western area telemetry is monitored in this manner. Manual reading accounts for roughly the other half and controllers reported that they prefer manual reporting. The Weyton area has newly introduced the 'Public Switch Telephone New' system (PSTN), and it is expected that this new system will overtake the older systems.

4.8 Eastern area, monitors from a separate Control Room at Waltham Cross, is more integrated and all hydrometric and flood warning data is monitored on the PSTN system.

4.9 Thames Region is unusual in that it not only has the Flood Control Rooms, but it also has the specialised Thames Barrier Flood Control Room. Briefly, data from the East Coast Storm Tide Warning Service (ECSTWS) based at Bracknell, together with data from the Barrier's own computer analysis of the situation is used by the barrier controller to take the decision to close the barrier. This report will not examine the Thames Barrier operation in any detail.

4.10 Meteorological conditions are monitored on two VDUs, one receiving detailed rainfall data from local weather radar. Exceptional weather conditions are reported separately by facsimile.

4.11 Thames Region then is unusual in comparison with other Regions. In practice, there is a 'super area' rather than regional Communications Centre; there are two Flood Control Rooms each operating different systems; and there is the Thames Barrier Control Room.

4.12 Lastly, it should be noted that the Thames Barrier Control Room acts as a reporting centre for other Regions from 17.00 to 09.00 hours on weekdays and throughout weekends and public holidays. In the unlikely event that other reporting centres are incapacitated, the Thames Region Communications Centre acts as fall-back centre. These procedures have been formalised in the national 'Emergency Liaison Arrangements'.

5. COMMUNICATIONS

5.1 Thames Region operate a region wide radio network. The network has three channels, two of which are used by Flood Defence and Water Quality staff. The Navigation Department has a separate dedicated radio network. The system is not shared with the regional water company, a significant advantage which some other regions do not enjoy. Blackspots are not a significant problem.

5.2 The radio network is complemented by a comprehensive distribution of vodaphones and pagers, particularly in the Water Quality and Fisheries Departments. Short range 'walkie-talkies' are also used.

5.3 The system has two useful additions: a teleconnect facility whereby a telephone or vodaphone user can be accessed into the radio network; and a facility for sub-control whereby, a user with a mobile unit box can be accessed into the net. The teleconnect facility is a considerable advantage, effectively allowing all vodaphone carriers to become part of a wider, enhanced network and providing a ready alternative when attempting to communicate from a difficult area. The system may be modernised in the near future with a trunk line radio network.

5.4 Public reporting of incidents can be made either on a free (0800) or (100) number to the regional Communications Centre at Reading or directly to district offices on local numbers. In addition, three ex-directory lines are maintained for the emergency services and for the NRA employees. Unlike other regions, Thames does not positively encourage all calls first to come direct to the Communications Centre, so only about half of all reported incidents are handled by the centre. The advantage of this system is that districts instantly deal with incidents; however, they do not necessarily report back to the Communications Centre with the result that the centre cannot be described as 'all informed' of the Region's daily handling of incidents. Effectively the Communications Centre is losing a considerable portion of the information loop and this may be seen as a weakness. Currently, the Communications Centre is acting as a 'super-area' Communications Centre rather than as a true Regional Communications Centre. This compares with, for

example, Wessex Region, where the majority of calls are received through the Regional Centre, and where an electronic logging and mailing system ensures that the Regional Controllers are aware of those incidents which were not directed in the first instance to them, but to the area offices.

5.5 The Regional Headquarters is not, however, isolated from significant incidents. Category 1 and 2 pollution incidents are reported in hard copy to the Regional Headquarters and Fisheries Officers submit written reports following significant incidents. Flooding events are reported from regional level as a matter of course. Details of these reporting procedures, which would be those used in the event of an emergency, are examined in Section 3. Procedures. The PR function, however, does not appear well integrated with the reporting system with the result that pro-active PR, such as is practised by South West Region, is generally not available. The strength of a centralised reporting system controlled by the Regional Centre is that it provides a ready focus for the PR office to monitor the day to day business of the region, to anticipate media interest, and to promote 'positive PR'. This is not generally the practise in Thames Region and the effectively 'super area' status of the Communications Centre is a contributor to this situation. The implication in the event of an emergency is that the Communications Room may not instantly be aware of the situation and be able to alert the PR office.

5.6 Vodaphone is used extensively throughout the Region, in some cases almost entirely replacing the function of the radio network. Fisheries, for example, have to communicate principally with outside agencies and have little use for the radio network. In the Lee area, by contrast, radio communications are still used extensively by Flood Defence and Land Drainage staff.

5.7 Overall, Thames Region communications are efficient and there is sufficient redundancy to cope in an emergency situation.

6. EQUIPMENT

6.1 No departments reported equipment deficits which could affect emergency operations. The one exception - protective clothing for flood defence staff assisting pollution staff in potentially toxic environments - is covered in Section 2 Personnel Arrangements.

6.2 Fisheries reported emergency stocks at area level with no outstanding equipment deficits. Loaning between areas is practised and there was no reported requirement for emergency 'crash wagons'.

6.3 Environmental quality staff hold emergency stocks (mainly of oil pollution dispersants) and districts maintain emergency packs. The distribution of these stocks throughout the Region was described as comprehensive.

6.4 Flood Defence staff reported adequate equipment stocks. Indeed, in comparison with other regions, Thames Region makes little use of contracted work. The main exception is in the metropolitan area where four contractors are commonly employed for work requiring bulk movements.

6.5 Overall, Thames Region appears to be generously equipped to cope with emergencies. Given the central location of the Region, it is probable that any unforeseen demands would be met quickly using contract work and equipments anyway.

7. EXERCISES

7.1 Thames Region do not run their own exercises but have taken part in local authority exercises. Due to poor coordination, these have not been assessed as valuable. Last year, Thames Region attended a British Pipeline Agency exercise but did not commit resources to the exercise. Currently, an exercise is being planned for the autumn in which it is hoped to involve the Fire Brigade and

Police. Scenarios beings considered include a road traffic accident and spillage, a slurry pollution, or a fire at a chemical site. It is recommended that additional exercises with large corporations (such as oil companies with significant installations in the Region) be held which might benefit the NRA, particularly if the PR angle is exploited.

7.2 While not compensating for exercises, Thames Region does hold a useful Quarterly Emergency Planning Forum. The Forum is attended by the relevant specialist managers and the Emergency Officer acts as secretary. It is recommended that the PR office might usefully attend these meetings. The Forum is tasked with reviewing emergency planning arrangements and risks, and with discussing 'near miss' incidents.

In addition, debriefs are held at senior levels following a significant incident, but these were described as informal. It is suggested that debriefs might usefully be held at the operational level and 'lessons learn' be published. This suggestion was resisted - at the operational level debriefs happen 'over a pint of beer afterwards'. Nonetheless, the analysis and dissemination of incidents does prevent districts or areas from becoming too parochial and helps improve the general awareness of the organisation's performance throughout the Region.

The Region also runs numerous seminars with outside agencies and there is, reportedly, a successful annual flood warning seminar. It is recommended that seminars might be extended on a more regular basis, between departments, to improve knowledge of each others functions and capabilities. There might usefully be PR involvement at these seminars to enhance 'PR awareness' among staff.

Lastly, annual liaison meetings are held with police and other emergency services.

8. FINANCIAL

8.1 No financial constraints were reported which might affect emergency operations. The knowledge of emergency funds or reserve funds was not reported by interviewees.

9. CONCLUSION

9.1 Thames is a politically sensitive and operationally busy Region. For historical reasons, an amorphous organisation has developed in which departments appear to enjoy a greater degree of independence than in other regions, and where, comparatively insularity rather than integration is common. The Region has emergency procedures but there are, by self-admission, 'by no means comprehensive enough'.

9.2 Most noticeably, the insularity appears to have bred a poor relationship with the PR office (other factors beyond the scope of this report also contribute to this situation). This is regrettable. Thames Region, potentially, could be the 'flagship' for the NRA, promoting a positive image as the environmental organisation of the 1990s. Further, in the event of an emergency, public perception inevitably is guided by media reporting, no matter how well NRA staff actually perform. If, on a day to day basis this relationship is not exercised positively, then the chances that the organisation will promote itself well in an emergency are not good.

WESSEX REGION

1. INTRODUCTION

1.1 Wessex area includes the counties of Avon, Somerset and Dorset, together with parts of Wiltshire and Hampshire, and is divided into three catchment areas. The Region's area comprises almost 10,000 sq km with a population of about 2.5 million.

1.2 Wessex Region includes some 254 km of coastline and 2,312 km of main river. There are 142 km of sea and tidal defences protecting an area of land comprising 635 sq km and including 25,600 properties. Almost 200 sq km of the Region's area is below sea level. A significant proportion of the waterways are fishing rivers with 832 km of game fishing rivers and 553 km of coarse fishing rivers. The Region also includes the River Parrett which is tidal for 22 km of its length.

1.3 The main threats to tidal flooding are on the Bristol channel which has to withstand exceptional high tides and surges and, in the south, on the English Channel coast which periodically suffers from Atlantic storms. Chesil, on the South coast, remains particularly vulnerable to flooding. Fluvial flooding remains a threat on the Rivers Parrett, Avon and Stour.

1.4 The Region issued over 10 flood warning over the last winter, including 1 red and 4 amber warnings. Pollution incidents numbered 1,800 of which 12 were category 1, 12,400 were category 2 and over 530 were category 3. Fisheries staff assisted in a small proportion of these emergencies.

2. PERSONNEL ARRANGEMENTS

2.1 Wessex Region operates a mix of on duty, and on call personnel for incident

handling. The Flood Defence, Water Quality and Fisheries departments have each developed separate personnel arrangements. The former, for example, relies more on senior management personnel where pollution incidents tend to be managed at catchment area level. Most noticeably, the Regional Emergencies Officer has no clearly delineated role and has perforce adopted a 'roving brief'.

2.2 Wessex Region operates a control room, the Rivers Control Room on a 24 hour basis, based at the Regional Headquarters at Bridgwater. A team of controllers are headed by a Chief Controller. During working hours the room is manned by both the Chief Controller and a Duty Controller. During out of work hours, a single Duty Controller routinely mans the Control Room. The controllers are responsible for receiving and logging incoming calls, monitoring the meteorological and telemetry systems and assisting specialised staff in the event of an emergency. During out of work hours, the Control Room has the additional role of telephone exchange for the Regional Headquarters. The Chief Controller and Duty Controller are not directly responsible to the Regional Emergencies Officer but report to Flood Warning and Defence, and this is seen as a weaknes.

2.3 Wessex Region appointed a Regional Emergencies Office last autumn. This officer has routine security as well as specific emergency duties. The former are timing consuming and may better be performed by a separate security officer. This would free the Emergencies Officer to solely manage the emergencies function which, at the moment, is ill-defined. The Emergencies Officer works to the Flood Defence Manager where he would be better placed as an 'independent' officer responsible for the Control Room and its staff and for the overall management and coordination of procedures and emergencies. In this case, he would report to a manager outside the emergencies functions, a position which would give him the authority to modify procedures and systems effectively. The status and ill-defined roles of the Emergencies Officer are seen as a weakness.

2.4 The flood warning function is performed by team of Duty Hydrologists on a weekly rota system and, during the winter months, by a team of Tide Watch Coordinators. The Duty Hydrologists and Tide Watch Coordinators are

responsible for the routine interrogation of the relevant systems, as well as the close monitoring of the same when flooding conditions are likely. The provision of lap top hardware allows duty officers to monitor conditions from home. While responsible for preparing the flood warning, they do not issue the warning - this function is handled by the Controllers.

2.5 The Flood Defence function is integral to the flood warning. The relevant catchment area engineering manager is informed by the Control Room of likely flooding in his area and he is responsible for any necessary defence or alleviation work using a team of supervisors and manual labours. If additional resources are required Wessex Region's construction and transport units can provide plants, equipments and manual labour. Both units increase their levels of manning at their respective depots in the likelihood of flooding incidents and personnel may be put on standby.

2.6 If additional resources were to be required, local contract work can be made available, using resources contracts which have been developed over previous years.

2.7 Overall management of a flood emergency is generally exercised by the Regional Flood Defence Manager or by his deputy. This arrangement appears 'management heavy' in comparison with other regions where the department heads are kept informed but do not 'run' incidents.

2.8 Pollution incidents are generally managed by Water Quality Control staff at catchment area level. Information on pollutions is received either at the Control Room or at the catchment area offices. This information is passed to the on duty 'Incident Controller'. During working hours he may leave the office and attend the incident or he may delegate the incident to another Water Quality Officer (for example, if the incident occurs in an area with which he is unfamiliar). During out of work hours, the on duty 'Incident Controller' deals with the incident himself. The Water Quality Officer at the site of the incident reports to the Senior Water Quality Officer, who may himself assist if necessary.

2.9 The system reportedly 'works' but has an apparent weakness. If the on duty 'Incident Controller' deals with the incident himself - as he may do during working hours, and certainly during out of work hours - he effectively stops fulfilling the role of Duty 'Incident Controller' and becomes a field controller. If a second incident is reported, either he or the Control Room must then 'ring round' and call out a second Water Quality Officer. If a third incident is reported, the procedure is repeated. In some instances, the on duty 'Incident Controller' may decide not to call out other officers and simply deal with the second or third incidents sequentially, a practise which lacks a sense of urgency. A better recommended system (such as that used by South West Region) would maintain an on duty Pollution Officer at area level who would receive the incoming call and delegate the incident to the relevant Water Quality Officer ie. that officer with most experience of the 'patch'. The on duty officer would not leave the office thus remaining in a true sense, the on duty 'Incident Controller'. This system has the advantage that incidents would be responded to instantly and not on a sequential basis.

2.10 The Fisheries Departments do not operate a formal duty or call out system. Each catchment area is headed by a Chief Fisheries and Recreation Officer with two assistants. There are 4-12 Fisheries Inspectors (or Bailiffs) in each catchment area. Incoming calls are received at the Control Room, from Water Quality Control staff, or direct to the Fisheries Department. Individuals may also receive phone calls directly from personal contacts which they have established over many years. A member of staff is then delegated to deal with the incident either because he has local knowledge or on a 'catch as catch can' basis during out of work hours (for example, the Rivers Control Room 'rings round' until a Fisheries Inspector is found to be available).

3. PROCEDURES

3.1 Wessex Region hold a general emergencies procedures manual which includes

pollution, flooding and fisheries emergencies. In addition, each of the catchment areas hold flood defence manuals specific to the areas.

3.2 The emergencies manual has been newly revised by the Emergencies Officer from previous outdated documents and forms the basis of Wessex Region's response to emergencies. The revised document is concise and appreciated by the departments. It was reported, however, that there are no contingency plans for 'mobile risks', such as the recent derailment at Bradford-on-Tone, and no site specific plans. The Emergencies Officer is currently addressing these deficiencies but the process is time consuming and may not be completed in the near future. The Emergencies Officer has also addressed the problem of the unforeseen evacuation of the Regional Headquarters building - in this case, emergency staff would operate from the County Emergency Centre at Taunton, and radio and telemetry compatibility tests have been successfully undertaken. In addition the holiday periods of the South West Region emergency officer have been arranged to ensure that each is available to take over the other's duties in the event of a major emergency. It was reported, however, that a 'borrowed' Emergencies Officer may be of little value if he were not familiar with another region's procedures.

3.3 Wessex emergency procedures are based on three key personnel: the Emergency Controller, the Field Controller, and the 'first person at the scene'. The Emergency Controller would operate from the Control Room and would be responsible for providing supporting staff to the field staff, mobilising regional resources, arranging for external aid and coordinating the Control Room staff. He would normally be the most senior specialist manager for the function (in the case of flood defence the Deputy Manager assumes this role, and in pollution emergencies the Catchment Control Manager would assume the role). Regional resources might include the construction unit, transport unit, the Flood Survey Coordinator and the PR office. External agencies might include the Police, district councils, the Fire Brigade, Bristol Pilotage and MAFF, as well as neighbouring NRA resources.

3.4 The Field Controller would be responsible for operations within his own area, using specialist knowledge to direct staff and resources at the scene of the emergency as directed by the Emergency Controller. He would normally be a senior area officer (in the case of Flooding Emergencies, the Senior Catchment Area Officer, and in the case of pollution emergencies, the Catchment Area Control Officer).

3.5 Lastly, there is a designated 'first person at the scene', this officer would be designated by the Emergency Controller as a result of being the member of staff who observes the event and who reports enough detail to allow the appropriate decisions to be taken; or as a result of being a member of staff sent to investigate an event, conduct a reconnaissance and report back.

3.6 These three key personalities would be expected to operate from the Control Room, the area Field Control Centres, and from a field control centre (a vehicle, property or office near the scene of the emergency). No such specialist vehicle currently exists.

3.7 Two broad points may be made. Firstly, there is no provision for rosters (some flooding incidents may last as long as 7 weeks), and secondly there is noticeably no mention of the Regional Emergencies Officer!

3.8 Rosters are arranged using available personnel but the procedures may be improved if a system of rosters were formalised.

3.9 Second, the Emergencies Officer must be included as one of the key personalities in the emergency procedures. Possible roles for the Emergency Officer might include assisting in the roster system at regional level, management of the Rivers Control Room and staff; external liaison, allowing the specialist manager to control internal resources; liaison between the local authority incident centre, and the Control Room, and management of the post-emergency debrief and collation of the relevant reports.

3.10 Supplementary manuals are held in the Control Room. These include local authority contingency plans, private company contingency plans (oil companies with major installations in the Region), weather warning manuals, response to telemetry manuals, general operating instructions for equipment in the rivers Control Room, telephone books, call sign and staff lists and a gazetteer.

3.11 Wessex Region uses a variety of reporting procedures. A general daily report system is run, which although does not have specific application to emergencies, can be used to keep all departments informed on a regular basis. Daily, each department head reports significant events to the Regional Manager. These are checked, collated and disseminated as a daily report for the Wessex Region. The report has a wide distribution and a copy is kept in the Control Room. This system is recommended as a simple way of keeping all departments informed of each others activities on a daily basis and is an example of how a routine reporting procedure can be exploited in emergency situations. The system might be improved if a PR supplement were to be added. This would ensure that the PR officer becomes integral to the daily reporting process and would enhance 'PR awareness' among staff in the event of an emergency.

3.12 Departmental reporting procedures are varied. Overall, procedures appear informal and ad hoc, but reportedly 'workable'.

3.13 Catchment Control staff use three levels of reporting depending on the seriousness of the incident. In the case of routine or insignificant incidents, a telephone or brief text update may be added to the initial logged report contained in the customer incident system, maintained in the Control Room. That incident would then effectively be considered 'closed' and would remain electronically stored. There is no hard copy. The advantage of this system is its simplicity. While not wishing to encourage 'paper mountains', a back-up hard copy might be a useful addition to the system (when comparisons, studies or monthly reviews are undertaken).

3.14 In the case of more significant incidents file notes are maintained by the individual

Water Quality Officer who dealt with the incident, in addition to the update on the logging system. Again, while not wishing to promote gratuitous report writing, a formal hard copy reporting format would ensure that knowledge does not become 'personalised' in individuals notebooks and that there is a wider sharing of experience.

3.15 Lastly, significant incidents or emergencies are reported fully with statements, photographs and statutory sample reports. It is recommended that a copy of such reports is maintained in the Rivers Control Room. In this manner the Control Room would not only be the focal point for all daily reporting, but it would also hold a monthly archive of all significant incidents.

3.16 Flood Defence staff do not maintain a standardised reporting format. In the event of a routine incident or emergency, updates are provided, and when the event is closed, a debrief and final report is produced. This report was described as 'ad hoc'. There are advantages if a flood incident reporting format were formalised. A suggested daily audit system, for example, including details of work undertaken and of expenditures, would ease the burden on officers when collating the final post-incident report.

3.17 The Fisheries Department declared no formal system of reporting (except in the case of fish kills). Very recently, an electronic logging system has been introduced. The principal reason given for the absence of reporting procedures was the experience of the staff. This is an example where valuable knowledge may become 'personalised' and eventually lost when that member of staff leaves the organisation, if no formal records are maintained. The department does keep aide-memoire style guidelines which staff take to incidents. In addition, special procedures are maintained for incidents at sites of special scientific interest (SSSIs).

4. EMERGENCY CONTROL FACILITIES

4.1 Wessex Region runs an Emergency Room, the River Control Room, on a 24 hour basis located at the Regional Headquarters at Bridgwater.

4.2 The manning of the Rivers Control Room is examined in section 2 Personnel arrangements. This section will examine the systems used in the centre. The Control Room systems are duplicated in the catchment area offices at Bath (serving Bristol Avon catchment area) and at Blandford (serving Avon and Dorset catchment area). Somerset catchment area offices are co-located with the Regional Headquarters. Only the Regional Control Room, however, operates an automated alarm system. The duplication of systems allows each of the catchment areas to manage incidents without recourse to the Regional Control Room and gives the Region communality of data.

4.3 Meteorological information is received from two sources, the National Meteorological Offices at Bracknell and from the local weather centre at Bristol. The former provides rainfall levels and direction service which is displayed on a single VDU. Bracknell also provides the storm tide warning service based on surge data and wave swell data. This information is received by facsimile and is compared with regional telemetry to forecast likely flooding conditions. The storm tide warning service is generally only provided during the winter period but good liaison ensures that outstanding meteorological conditions are reported to the Rivers Control Room, outside the normal reporting period. Bristol provides a local daily weather forecast as well as supplementary forecasts in the event of heavy rainfall or storm conditions.

4.4 Wessex currently operate 309 rain gauges, 175 river flow measuring sites and 115 sites with telemetry. In addition, the Region have newly introduced 'Merlin', an automated pollution monitoring system which has been featured in 'The Water Guardians' magazine and which was subject of a feature in the BBC Programme 'Tomorrow's World'.

4.5 The monitoring of these systems is currently being changed from the dated 'Delta Technical Services System' to the 'Servelec' system. 'Servelec' is still being developed and is less than two thirds operational. As a result the systems are currently working in tandem and an assessment on the strengths and weaknesses of the new system is withheld.

Essentially, 'Servelec' will monitor rain levels, sluice gates, flow rates, river levels, tidal gauges and pumping stations. The information will be displayed on two VDUs and a third VDU will be reserved for alarm displays. The key difference between the old and new systems will be in the nature of the interrogation of the systems - 'Servelec' will operate 'intelligent' outstations with self-interrogating alarms. Although each of the catchment areas will benefit from 'Servelec', the alarm system, it is reiterated, will be retained at the Regional Control Room.

The new system is welcomed as a considerable improvement over the existing telemetry monitoring systems.

5. COMMUNICATIONS

5.1 Wessex Region operate a radio network as well as making extensive use of vodaphones and pagers, and limited use of short range radios.

5.2 The radio network is shared with the Wessex Water Company and is expected to be replaced in a two year period with a joint but improved trunk system. The radios are 'car-fits' necessarily limiting from where they can be operated. Blackspots are not a significant problem.

5.3 During working hours the Control Room monitors the Somerset catchment area. Bristol Avon, and Avon and Dorset catchment areas operate under the control of the Wessex Water Company. This arrangement ensures that traffic is manageable but it is possible that NRA traffic may not receive prompt responses in the latter two cases, particularly if there is a compromise of water company

interests.

5.4 During out of work hours and emergencies all channels are opened. The relationship between NRA controllers and their water company counterparts is reported as good. It should be noted that the Fisheries Department no longer make use of the radio network and rely solely on vodaphones.

The principal weaknesses in the system are the sharing of the network with another major user and the quantities of short range radios. The use of held-vodaphones has reduced the significance of these problems.

5.5 Telephone communications are not examined in detail but two points need to be made. Incoming public calls can be made on a local charge (0345) number and two ex-directory numbers are retained for use by NRA staff. There is no freephone number. It is estimated that 90% of public calls are made to the Control Room and that the remaining 10% are made to the area offices. Reported incidents are logged by the Control Room staff on an electronic customer incident system and the area offices can access this information using the mailing facility. The customer incident system becomes the basis of future reports, updates being added to the initial report, electronically, by staff who deal with the incident.

6. EQUIPMENT

6.1 Wessex Region maintains several depots: at Chippenham for Bristol Avon; at Blandford, Fordingbridge, Salisbury and Dorchester for Avon and Dorset; and at Bridgwater, Dunstor, Burnham-on-Sea, Minehead, and Weston-Super-Mare for Somerset.

6.2 These depots hold equipment and plant but no specially designated emergency stocks or vehicles. Both catchment area control and fisheries staff expressed doubts over the value of establishing emergency 'crash vehicles' (Who would

maintain them? Which equipments should be placed in the vehicles? What would happen in the emergency only required certain equipments but in large quantities - would the vehicle have to be unloaded and loaded again?).

6.3 Flood Defence can and do call on the equipments and plant held by the construction and transport units. In the event of flooding incidents both units increase the levels of manning in anticipation of demands from the catchment area engineering departments. Additional staff are also put on standby.

6.4 No department reported equipment deficits and contract workers or assistance from neighbouring NRA Regions can be made available in major incidents.

7. EXERCISES

7.1 Exercises are not commonly held in Wessex Region. Invitations to assist or advise on exercises held by private companies (principally oil companies) have been received in the past.

7.2 The regional emergencies officer recognises that there would be benefits from exercising periodically. In October, a communications flood defence exercise will be held to familiarise new staff with emergency procedures before the onset of winter. This is a valuable initiative which would benefit other regional control centres with new or relatively inexperienced staff.

7.3 All the departments expressed doubts over the value of real time exercises. Nonetheless there was approval to the proposal that departments should hold seminars in which they explained their functions and capabilities in other departments. These seminars could be extended to outside agencies, such as the police or local authorities. The Fisheries Department, for example, noted that their expertise in boating is not exploited in flooding incidents. This reflects a lack of knowledge of other departments capabilities rather than an unwillingness to cooperate and would be rectified with inter-departmental seminars.

7.4 Annual liaison meetings with outside agencies have also been introduced. Although these are not offered as a substitute for exercises, they do provide an opportunity to resolve problems in 'slow time' before those problems have to be faced in a real emergency.

8. FINANCIAL

8.1 No financial constraints were reported which might affect emergency operations.

8.2 The Emergencies Officer is examining the feasibility of introducing a daily audit sheet. In the event of an emergency of long duration (flooding can last for a period of several weeks), a daily record of expenditures might be maintained, easing the burden on officers tasked with 'washing up' after a long operation.

9. CONCLUSION

9.1 Wessex Region has a good record on emergencies. Floodings occur in predictable areas, and other than the Chesil area, are alleviated using well practised routines with little threat to properties or lives. Pollution and fisheries emergencies are handled efficiently but it was reported that 'a sense of urgency' would improve the performance of staff.

9.2 This latter point raised an issue which might equally apply to all NRA Regions. The 'emergency services' ethos which is evident for example in other public services such as the Police or Fire Brigade, while not absent in the NRA, is not strong either. This is attributable to several factors. Generally, there is no threat to life; operational staff tend to be older, experienced personnel whose familiarity with routines encourages a 'creeping casualness' (this criticism can of course be applied to almost any organisation!); and lastly there is no formal external mechanism to investigate and comment on the performance of departments following major incidents. In comparison with another public service, such as

British Rail for example, there is no 'inquiry' following a major pollution incident, asking the very sensitive question - 'Might we have performed better?' This 'trouble-shooter' role might usefully be fulfilled by the Emergencies Officer. In order to undertake this task, full reporting and debriefing procedures must be encouraged and the Emergencies Officer must have the backing of senior management. In this manner, performance might be enhanced, and departments be better prepared to handle emergencies.

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SOUTH-WEST REGION

1. Introduction

1.1 South West Region covers an area of some 10,884 sq. km. and includes Devon, Cornwall, and small parts of Dorset and Somerset. The region is responsible for over 5,000 km of river and 349 km of estuary. In addition there is 685 km of coastline, including 133 EC designated bathing waters, almost one third of the national total.

1.2 The Regional Headquarters is based at Exeter. Eastern Area Headquarters is colocated with the Regional Headquarters and there is a Western Area Headquarters based at Bodmin. There are also several operational depots situated around the region.

1.3 South West, with its high annual rainfall, steep, impervious catchments and long, exposed coastline, remains vulnerable to fluvial and tidal emergencies. Whereas the latter are rare, flooding on the South West's short, steep rivers is a more common occurrence. During the financial year 1989/90 the Region issued 146 warnings of which 26 were categorized as serious. Pollution incident remain a serious problem with an average of over 2,500 reported incidents a year, of which 20-30 are category 1 incidents.

2. Personnel Arrangements

2.1 South West Region has recently appointed a Regional Emergency Procedures Officer (at the time of reporting, the appointee had been in post for 2 months). The Officer is responsible for the overall co-ordination of flood, pollution and fisheries emergencies, both within the NRA and with outside agencies, although in practise this role is exercised only in major emergencies; for the overall provision of emergency procedures manuals and reporting systems; and for the good management of the Regional Communications Centre or RCC.

Five communications staff man the RCC on a 24 hour basis.

2.2 Routine handling of incidents is conducted by the relevant departments using a mix of duty and call out systems.

2.3 Pollution incidents are reported through the RCC to the Assistant Pollution Officer at Regional level. The information is then passed to the relevant Area Assistant Pollution Officer who informs the relevant Catchment Area Inspector (there are between 8-10 in each area).

2.4 The latter then becomes the Field Controller at the incident site and he may call on assistance from neighbouring Catchment Area Inspectors, the multi-disciplinary River Wardens, or fisheries staff if relevant. The Catchment Area Inspectors are on a call out system. At area level there is a formal Stand-by Pollution Officer out of office hours. Except in the case of major incidents or during working hours, the Stand-by Pollution Officer remains responsible for the overall management of the incident and reporting from the Inspectors is direct to this Officer.

2.5 Liaison with outside agencies might include the South West Water PLC, downstream users and abstractors, County Council Emergency Officers, Local Authority Health Officers, MAFF, The Trust for Nature Conservation, Angling Associations, riparian owners' groups, the RSPB, Medical Officers of Health, specialist pollution clean-up teams and the Emergency Services. Field Controllers, Assistant Pollution Officers and the RCC staff all hold contact lists for outside agencies.

2.6 The system retains flexibility depending on whether the incident is reported to the regional or area officer. Public calls received directly at the area offices are dealt by the Assistant Pollution Officer.

In these cases the area offices become the Incident Headquarters and the Assistant Pollution Officer becomes responsible for 'managing' the incident (maintenance of an incident log, liaison with internal and external Agencies). On site, a Senior Pollution Inspector is available to co-ordinate the activities of the Pollution Inspectors, task assisting fisheries staff, and handle the Public Relations function, if necessary. The 25 River Wardens may also be co-ordinated on site by the Senior Pollution Inspector.

2.7 Flood warnings are the responsibility of a formal Duty Flood Warning Officer at Regional level. The operational response remains a separate function through a chain of Regional and Area Operational Engineers, superintendants, foremen and manual workers.

2.8 There are six Regional Duty Flood Warning Officers, each on duty for a week at a time. At the end of the six week period, the Officers meet to discuss the preceding duty period and to evaluate procedures. This process of continual re-assessment is considered valuable and contributes to an efficient services.

2.9 There is no formal roster for Fisheries staff (it is not required), and call out procedures reportedly are adequate. A Fisheries Inspector, often in conjunction with a River Warden, works under the Pollution Officer at the incident site and reports to his own Area Fisheries Officer. Fisheries Inspectors are called out to an average of 100 emergency incidents every year.

2.10 Whereas personnel arrangements at area level and in the field appear effective, at regional level, there were reported possibilities for improvement. In fairness these have only become possible with the appointment of a Regional Emergencies Officer. In major emergencies this officer would be responsible for the overall management of the incident and would provide the necessary liaison, both within the NRA (with, for example, the Public Relations Officer, Chief Pollution Controller, Environmental Protection Manager, as well as across Departments); and with outside Agencies. During the serious Rose Bay pollution incident last year an NRA Officer (in this case, the Pollution Planning Officer) was required at the Local Authority Joint Response Centre. With a new Regional Emergencies Procedures Officer, roles such as these would be better fulfilled.

2.11 In addition, a general 'Emergencies Manager' in the RCC relieves pressure on the Duty Pollution or Flood Officers who would be expected to co-ordinate their respective teams from this joint Regional Emergency Control Centre in a major incident. A major factor in the success of future operations would be thorough post-incident debriefs. The new South West Regional Emergencies Officer has begun initiating debriefs after significant incidents.

3. Procedures

3.1 South-West Region maintain emergencies procedures manuals of varying standards. The new Regional Emergencies Officer recognises the weaknesses, and steps are being taken to revise the manuals and to maintain them at one common high standard.

3.2 Flood warning and flood defence maintain two manuals, a Duty Flood Officer Operational Manual which outlines warning procedures, and a Flood Response Manual which gives guidelines to engineering officers at the incident site. Copies are kept at regional and area level, are comprehensive and are regularly amended.

3.3 Tidal and fluvial flood warnings share in general procedures but vary in detail. The principal behind South West Region's warning system is pro-active rather than reactive response, i.e. Duty Officers interrogate systems and make interpretations from data received, rather than relying on fully automated systems. This system is considered more efficient and apposite to local conditions which require experienced human, rather than computer interpretation.

3.4 The Duty Flood Warning Officer, operating from the RCC, is responsible for issuing faxed warnings to the relevant agencies. These may include County Councils (in the case of tidal warnings); The Devon and Cornwall, Avon and Somerset, or Dorset police forces; the relevant fire service; and local authorities. NRA Wessex and British Rail may also be informed.

3.5 Internal distribution may include, the Regional General Manager, Engineering Manager, Chief Engineer, Public Relations Officer, Area Operations Engineers, the Hydrometric Engineer and Pollution Officers as well as the MAFF Regional Engineer. Distribution to outside Agencies is by facsimile using a simple colour code system.

3.6 South West Region, in consultation with the relevant police forces, have reassessed the national yellow, amber, red colour code system. Effectively, the warning 'Capture' has been reduced realistically to reflect local conditions (previous floods have demonstrated that the police could not be expected to warn all potential flood victims within the previous parameters). Alternative systems such as, use of Fire Brigade Operations Centres, Neighbourhood and Farm Watch Groups have proved effective as back-up to police and local authority warning procedures.

3.7 The Duty Flood Warning Officer remains on duty until the stand-down is issued. He may call for assistance from the River Wardens to check malfunctioning gauges, handle the Public Relations function (although media releases are used to pre-empt inquiries), and initiate flood reconnaissances. He also remains responsible for keeping the Regional Emergencies Officers informed.

3.8 The operational response is handled by the Engineering Division of the Flood Defence Department. This Department, in keeping with National NRA policy, retains a statutory but permissive duty to assist in floods. Effectively, assistance is discrete but not obligatory. The South West Region Flood Emergency Procedures Manual explains this role:-

3.9 'The first priority in flood emergency situations is to deal with problems on 'main river' and to ensure that flood alleviation and tidal defence schemes operate effectively. Flooding from minor watercourses is the responsibility of District Councils. County Councils may also be involved with road flooding and blocked bridges. If resources are available after dealing with 'main rivers' assistance may be given on minor watercourses.

3.10 No formal stand-by system operates in the area as flooding incidents are normally infrequent and irregular. If conditions look as though they may develop into a flood situation after normal working hours, staff and men may be put on stand-by for an evening or weekend period.'

3.11 The lack of a clear delineation of roles resulting from the latitude offered in the statutory arrangements does lead to problems of co-ordination in major emergencies. These are resolved through local arrangements but it was commented that all agencies may work together more effectively if roles were more precisely defined, in a national policy statement.

3.12 A Pollution Inspector's Manual, is maintained but recognised to be out of date and will be revised in the near future.

3.13 In addition to these manuals, a General Emergencies Procedures Manual is being produced. This document will contain the principal elements of the flood and pollution manuals and will be aimed at a readership which would include NRA senior managership as well as outside agencies such as local authorities and the police.

3.14 The RCC also holds County Council emergency plans, and South West Water PLC plans. A wide dissemination of contingency plans is recognised as an important, and the Regional Emergencies Officer is active in liaising with outside agencies and in ensuring that NRA Emergency procedures have the widest possible dissemination.

3.15 Reporting procedures, similarly, are of a varied standard. Pollution staff use a Regional Pollution Incident Logging System or 'PILS'. Post-incident reports are stored electonically and hard copies are distributed to the relevant River Wardens and Pollution Inspectors and to the Regional Pollution Officer. There is no distribution to the RCC which currently receive poor feedback on incidents, and this is seen as a weakness. The implementation of a 'VAX' mailing system (see Section 4 Emergency Control Facilities) would remedy this problem.

3.16 Flood warning and flood defence use a regionally developed reporting system. Following the initial flood warning, regular situation reports (using the same distribution list) are disseminated. Post-incident as well as routine Duty Officers' weekly reports are also maintained.

3.17 Fisheries staff are currently in the process of introducing a fish kill reporting format based on the Welsh example. This is an example of one Region borrowing another's 'good idea', and demonstrates how standardization can occur by evolution. It also has legal implications: NRA prosecutions may carry more 'weight' in a court if the evidence is offered on a standard reporting format and as a 'national standard', avoiding allegations of regional prejudices and of varying standards.

4. Emergency Control Facilities

4.1 South West Region operate a 24-hour Emergency Regional Communications Centre or RCC. The RCCs role is described in publicity leaflets - 'A team of experienced operators is on hand to receive emergency calls from the public, liaise with outside organisations, keep in touch with NRA employees and monitor information automatically collected by computer equipment in the field.'

4.2 Existing telemetry (over 100 flood warning stations and 80 primary gauging stations) is fed into a dated but effective 'Aquarias Outstation Interrogation Log' software package. Replacements for the current 'Wang' hardware are actively being sought but the current possible replacement, 'Opus', is proving unsatisfactory. Pollution guages (two have recently been installed) are fed into a 'Supersync 3 A' system on a separate VDU. This system appears unsatisfactory with a current limited capacity of three guages to one VDU. Any expansion of the existing use of pollution gauges would result in an unworkable number of VDU's in the RCC.

4.3 Metereological data is received through the National Storm Tide Warning Service at Bracknell and via the local metereological office at Plymouth. The former service is considered too general for accurate flood warnings. The service provided by the Plymouth office includes essential barometric condition checks which permit more accurate interpretation.

4.4 Tidal guages and a well tested system of threshold calculations complete the data interpretation cycle. In the case of fluvial flood warnings, rainfall and river level gauges at over 80 out stations are interrogated in addition to data interpretation from the metereological radar and synoptic charts. The software ('Aquarias Outstation Interrogation Log') was devised by NRA employees and is considered efficient. The 'Wang' hardware, however, is dated and maintenance has become a problem, to the extent that the service may become inefficient if a replacement is not purchased in the near future.

4.5 In general, South West Region's automated data collection system is workable but outdated. This weakness is recognised and replacement hardware is being sought. Software expansion is also being considered with the existing 'VAX' cluster and ethernet. 'VAX' is a multi-functional computer system which is common to South West Region, principally as a spread sheet and word processor. It is also possible to use 'VAX' as a mailing system. This function would speed the passage of information, provide an instant reporting medium and is currently being examined by the new Regional Emergencies Officer.

5. Communications

5.1 South West Region's communications are based on vodaphones and pagers. In the field there is also a limited use of hand held, short range radios. There is no region-wide radio network (the existing radio network was entirely assimilated by Southern Water Plc). The only reported weaknesses in the system are the numerous black spots in the Region. Given the undulating geography of the South-West, this problem cannot readily be alleviated without integration into a sophisticated radio network supplemented with rebroadcast stations. Discussions are currently underway on possible integration with such a newtwork which Southern Water Plc is expected to operate in the next 3-5 year period.

5.2 Incidents are generally received through the RCC on a free (0800) number or direct to area offices. It is important to note that only 30-35% of calls are made directly to the RCC. South West Region has a strong local character and it has been found that members of the public generally prefer to ring a local number than an impersonal '0800' number. Although this may change as the function of the RCC becomes better publicised, local reporting has not been discouraged, again demonstrating the importance of flexibility and of reflecting local conditions.

6. Equipment

6.1 South-West Region maintains significant equipment stocks at Clyst Honiton (Eastern Area), Launceston and Bodmin (Western Area). An additional depot for Eastern Area is located at Tiverton and there are several smaller engineering depots throughout the Region. Fisheries maintain emergency equipment at Endsleigh as well as at Clyst Honiton. In addition, a system of four Fisheries 'crash wagons' (2 in each area) is being initiated. There are no reported outstanding equipment deficits.The location of the depots reportedly allows key equipment to reach any site within the Region in a 30 minute time frame.

6.2 The Region, however, does lack sufficient boom equipment. South West currently does not have the capability to place sufficient booms across any of the major estuaries (in the Rose Bay incident, booms were borrowed from the Maritime Pollution Control Unit), and would be incapable of reacting effectively in a major disaster affecting more than one estuary.

7. Exercises

7.1 South West Region do not run regular exercises to test emergency procedures. This autumn, however, pollution staff will be holding a maritime boom construction exercise as well as a farm drainage exercise. Flood Defence staff do not hold exercises and generally expressed doubts over the value of testing staff who deal with real incidents regularly during the flooding season.

7.2 Interest was expressed in periodic communications exercises in order to confirm that flood warnings are receiving the correct dissemination. Such exercises would have to be conducted with the co-operation of the relevant authorities and should not be seen to be testing the efficiency of other organisations. Annual liaison meetings with flood warning users and periodic meetings with police in part already fulfil this function.

8. Financial

8.1 South West Region did not report any significant financial constraints which might effect emergency operations.

9. Conclusion

9.1 South West Region has a good record on responding to incidents, both large and small. The strong local character of the Region means that liaison is important and this has been exploited to produce an efficient service. The River Wardens' system is a good example of NRA representation at local level on a multi-disciplinary basis. Co-operation within South West Region's departments is also good. Emergency procedures have been refined to a high standard and communications, given the undulating terrain, are satisfactory. The Regional Communications Centre is well established, and with the appointment of a Regional Emergencies Officer, should play a more prominent role in the co-ordination of major incidents.

9.2 The principal weaknesses remain in equipment. South West Region does

not hold sufficient booms to protect any major estuary and would be incapable of responding to a major incident without outside assistance. Second, the 'Wang' hardware used by flood defence staff in the RCC has become unreliable and maintenance problems may affect operations in the future.

SOUTHERN REGION

1. INTRODUCTION

1.1 Southern Region comprises an area of 10,500 sq km with a population of 4.5 million. The region includes the counties of Kent, Sussex, the Isle of Wight, most of Hampshire and part of Surrey.

1.2 The Regional Headquarters is at Worthing and there are six area offices located at Winchester, Chichester, Pevensey, Rye, Tonbridge and Canterbury. Water Quality, Water Resources and Flood Defence are represented variously at these offices. Fisheries are county based and are represented at Winchester, Pevensey and Tonbridge. A recent assessment of the Regional sub-divisions has concluded that the present arrangement should be retained.

1.3 The region's key statistics include 2,748 km of main river and a 900 km coastline for which the region takes responsibility for 281 km of sea defences. Average rainfall levels are moderate to high with 739 mm recorded for the financial year 1989/90.

1.4 The main threat to the region remains tidal flooding with significant fluvial flooding much less common. A comprehensive programme of construction and maintenance of sea defences, with favourable weather conditions in recent times have ensured few major tidal floods - nonetheless, the region issued 109 flood warnings for the financial period 1989/90. During the same period the region recorded 1,306 pollution incidents of which 40 were categorised as serious. Fisheries staff attended 60 of these incidents and recorded 57 fish rescues.

2. PERSONNEL ARRANGEMENTS

2.1 Southern Region currently have no Emergencies Officer but expect to appoint one

by the end of the year. No single officer has fulfilled the emergencies role in the interim with the result that the function has been to some extent neglected. This is less an indication of unwillingness on the part of regional staff and more a reflection on other commitments. The new appointee will be expected to manage the regional communications centre which will be operational at the beginning of September, manage recently recruited controllers, update and in some cases produce new operational manuals, and coordinate emergency matters in general. The status of the new Emergencies Officer is undetermined but it is recommended that he remains independent of the functions he serves, reporting to a services or administration office (c. Severn-Trent Region).

2.2 The region are currently recruiting and training five controllers who will operate in the new communications centre. Alternative arrangements are dual: during office hours incoming telephone calls are received either at the regional switchboard, area offices or at the Plc control rooms. It was reported that public awareness of the role of the NRA in Southern Region is not satisfactory with the result that an undetermined proportion of public calls are first made directly to the Plc control rooms. It was further reported that in some instances where there may be a compromise of Plc interests, it is possible that the onward passage of information is being delayed. Calls received at the Regional Headquarters are passed automatically to the area offices without logging. Calls received at area offices or at the Plc control rooms are logged on a standard incidents report form and are then passed to the relevant departments.

2.3 During out of office hours all incoming telephone calls are currently received at the Plc control rooms who deal with the public on behalf of the NRA. The Plc controllers are responsible for logging calls on the incident report forms and for contacting the relevant duty officers. The Plc controllers may also support NRA officers if further assistance is required although, where possible, investigating officers manage assistance themselves or contact a senior NRA officer of the relevant function. The system is reportedly satisfactory with the single rejoinder that there may be instances where there is a clash of Plc and NRA interests.

2.4 In the future a regional freephone number will be publicised to encourage incoming office hour calls to be directed initially to the regional communications centre. During out of office hours the centre will take over the functions of the Plc control rooms and provide 24 hour coverage. It is expected that there will be a run in period of undetermined length with both arrangements operating concurrently during which time the most appropriate manning and reporting arrangements will be formalised. Many of the issues which other regions have had to resolve, such as - should incoming calls be logged or merely diverted? Are controllers only communicators or should they have other responsibilities? What will these responsibilities be? Have yet to be clarified and it is probable that the optimum solutions will only be found after a period of trial and error. The region is nevertheless fortunate in that there are many examples from which to copy and gain valuable experiences.

2.5 Current personnel arrangements in flood warning vary from county to county and are acknowledged to be unsatisfactory. Sussex and Hampshire have duty officers, but Kent operates on a 'catch as catch can' basis. In addition, there is no formal duty flood warning officer at regional level - again an informal cascade list is operated and is usually headed by an operations engineer. The reasons for these arrangements are twofold: historical and the fact that telemetry and weather conditions are still monitored principally by the Plc control rooms. In the future, Southern intend to implement six flood duty officer rosters (one for each area) but have no plans for a regional level flood duty roster. The latter function will be managed by controllers operating from the new regional communications centre. Despite the informal nature of current arrangements, it was reported that staff of the appropriate level and experience are available when recalled.

2.6 Pollution control staff operate formal flood duty rosters at area level with one member on duty for a week. The duty officer is responsible for a 'crash bag' with relevant equipment, a vodaphone and carries the regional pollution plan manual which is expected to be re-drafted in the near future. In a significant incident the duty officer may call on assistance from other Water Quality Officers, the district (soon to be area) Environmental Officer and Principal Water Quality Officer.

With the redesignation of district as area and with the re-drafting of the pollution manual, it is possible that staff arrangements may change in the near future.

2.5 Fisheries staff are county based and operate on a call out system. In the event of a major fisheries emergency, a 'widening circle' call out system is used with neighbouring county and regional staff available as required. Incidents on this scale are comparatively rare and most fisheries emergencies are dealt with at county level.

2.6 In general, Southern region personnel arrangements remain relatively informal and localised in comparison with other regions. The absence of up to date operational manuals and central direction, together with the fact that NRA staff at area level effectively report to Plc control rooms has encouraged areas to respond according to local arrangements. It does not necessarily follow that the region's response to incidents is poor but it does mean that an assessment of personnel arrangements, such as they exist, is made more difficult.

3. PROCEDURES

3.1 Southern Region have no regional level operational or emergency manuals. It is intended that one of the first tasks of the new Emergencies Officer will be to produce a draft regional operations manual.

3.2 The current pollution operational manual effectively comprises a list of useful contacts supported by a draft emergency pollution plan and emergency procedures aide-memoire. The former is divided into five sections: a general plan applicable to all pollution incidents, a river pollution incidents section, a river intake pollution incidents section, and annexures. The basis of the draft pollution plan will be a division of responsibilities between the so-called incident coordinator (usually the district/area Water Quality Officer) and the investigating officer. It is stressed that the plan is still in draft form and that all annexures have yet to be written. The latter (emergency procedures aide-memoire) has inherited from the

previous water authorities, is incomplete (again all the annexures have yet to be written), and is too lengthy to be regarded properly as an aide-memoire. It is possible, however, that the sections outlined in the aide-memoire (contamination of environmental waters and water supplies, procedures on receipt of incident reports, Head Office procedures, water procedures, soil sewers and sewage works etc) could be expanded and form the basis of a regional operational manual similar to examples run by other regions.

3.3 Southern have three flood warning/defence manuals which were inherited from the previous water authorities (Hants, East/West Sussex, and Kent). One of the manuals has been updated but there is little communality between the manuals. The Kent manual, for example, is logically presented with sections on individual responsibilities, procedures, warnings and liaison with external agencies. The East/West Sussex manual, by way of contrast, only devotes two sections to flooding and includes sections on fishing, boating and water supply intakes. In comparison with other regions, the manuals are of a low standard and re-drafting them will be a major undertaking. Currently, the updating and amending of manuals is undertaken independently within the various departments and overall supervision of the task has not been devolved formally to one member of staff - this situation should change with the appointment of a Regional Emergencies Officer.

3.4 Current procedures rely heavily on the use of the Plc control rooms. In the case of pollution incidents during out of office hours, Plc controllers remain responsible for logging the incidents and for contacting the relevant area duty officer. Copies of the report are sent to the new communications centre and to the investigating officer. In the case of flood warnings (during office and out of office hours) the Plc control rooms remain responsible for monitoring telemetry and for receiving weather reports, heavy rainfall warnings, gale warnings, wave and swell data and the East Coast Storm Tide Warning Service. The Plc control rooms do not, however, issue warnings - this function is retained by the regional offices of the NRA who receive the interpreted data from the control rooms, confirm its validity, and then issue the appropriate warnings to the Police. In the case of fluvial floods, police are currently issued after threshold levels are exceeded.

Under the new arrangements, weather data and telemetry will be monitored by controllers at the regional communications centre and by flood duty officers at area level. Yellow warnings will be issued by the regional centre which will concurrently inform area offices. The latter will then assume responsibility for the flood warning function and issue further amber or red flood warnings if relevant.

3.5 Current reporting procedures principally rely on verbal communications (radio, vodaphone and telephone). Significant incidents are reported on standardised incident forms. Water quality staff forward all category 1 and most category 2 incidents to the Regional Headquarters. Fisheries staff use the same form to report fish kills to the Regional Headquarters.

3.6 Lastly, in addition to the manuals described, Police emergency plans, local authority emergency plans, contacts lists, maps, regional equipment inventories and 'useful numbers' lists are kept in a library held in the new regional communications centre.

4. EMERGENCY CONTROL FACILITIES

4.1 Southern Region expect to be operating a fully manned regional communications centre to provide 24 hour coverage and a flood warning service by the beginning of September. The programme is on schedule and there will be a run-in period during which time both the NRA communications centre and Plc control rooms will run concurrently.

4.2 The centre will be known as the 'Regional Emergency Control System' or RECS. Telemetry systems are based on 'Streamline' (used by Severn-Trent) and the communications network will be based on PMR (either trunked or band 3 commercial radio - see Section 5. Communications).

4.3 The former is still in the process of commissioning but will include the following principal features. Up to 200 dynamic logic outstations, as well as some DTS, will

record data (river levels, rainfall, snowmelt, tides, temperature) and input to a central gathering centre at the Regional Headquarters. Polling will be automatic on a 24 hour basis and individual and/or group polling will also be available. The system will incorporate local weather radar, the Thames wall gates, and intruder alarms. Predictions will initially be based on rainfall thresholds triggering alarms (in the case of tidal flooding, forecasts will be based on tidal-surge predictions). Modelling for fluvial flooding and self-interrogations of outstations which trigger interrogations of adjacent outstations when certain thresholds are reached, are features which will be incorporated in the future. Presentation formats will include time-level graphs and diagrammatic representations of main rivers and tributaries.

5. COMMUNICATIONS

5.1 Southern Region currently use a three frequency VHF radio network shared with the water authorities, supplemented by vodaphones. The radio system suffers from several disadvantages: there are blackspots in the region; the radio is a 'car fit' so may have to be abandoned on site; and lastly, the water companies are also network users. As a result, traffic can be unmanageable (there may be as many as six hundred call signs on the net).

5.2 Future plans include an augmentation of the vodaphone network and the probable purchase of band three commercial radio. Southern is the only region considering opting for band three radio. The principal reason governing this choice is cost - band three radio is the most economical mobile communications system of its type and is considerably cheaper than trunked PMR which other regions are considering. There are no call charges with band three radio and companies who use the system pay a straight monthly subscription for the number of sets they have, and the coverage area they want. The subscription (£12-14 per mobile, per month) entitles the user to make as many calls as he needs inside his prescribed area. Band three radio calls are private and channel switching technology allocates a new pair of channels to each conversation. Other facilities

offered by the system include data transmission, automatic call queuing and control of who calls who. Lastly, strict limits on subscriber density help prevent overcrowding. In addition, switching techniques direct each two way conversation channel for the duration of the call, to avoid interference. The call only travels as far as the nearest transmitter before being routed to a land line which relays the signal to the transmitter closest to the controlling office.

6. EQUIPMENT

6.1 Southern Region have a central equipment and plant depot at Pevensey and also maintain smaller facilities at each of the six area offices. The region do not report outstanding equipment deficits which might affect performance in emergency operations.

6.2 Local contractors are commonly used, particularly by the flood defence department, and contacts built up over many years are recorded in the annexures of the inherited flood warning and defence manuals.

7. EXERCISES

7.1 Southern Region do not run a programme of exercises. This reflects the lack of a dedicated Emergencies Officer as well as the pressure of other commitments. Water quality staff did report taking part in an exercise run by Esso at Fawley and the flood warning department are hoping to run an exercise in October to test the new communications centre and telemetry systems.

7.2 While not compensation for exercises, the region does hold regular liaison meetings with police and local authorities over flood defence matters and water quality staff maintain links with local authority environmental health departments and with harbour authorities.

8. FINANCIAL

8.1 Southern Region did not report any financial constraints which might affect emergency operations.

8.2 However, authorisation procedures for unforeseen expenditures were unclear - none of the interviewees were able to explain what procedures are in place and there was no formal record of such procedures in any of the manuals.

9. CONCLUSION

9.1 Southern Region, in many aspects, has fallen behind the other NRA regions. The reliance on Plc control rooms for communications and telemetry, the absence of an Emergencies Officer, the lack of up to date operational manuals, the absence of comprehensive duty rosters for a core function such as flood warning, the lack of an exercise programme, are examples of the region's backwardness.

9.2 In fairness, these issues are being addressed and many will be remedied in the near future. The region does have an advantage that it may learn from other regions' mistakes and profit from their experiences.

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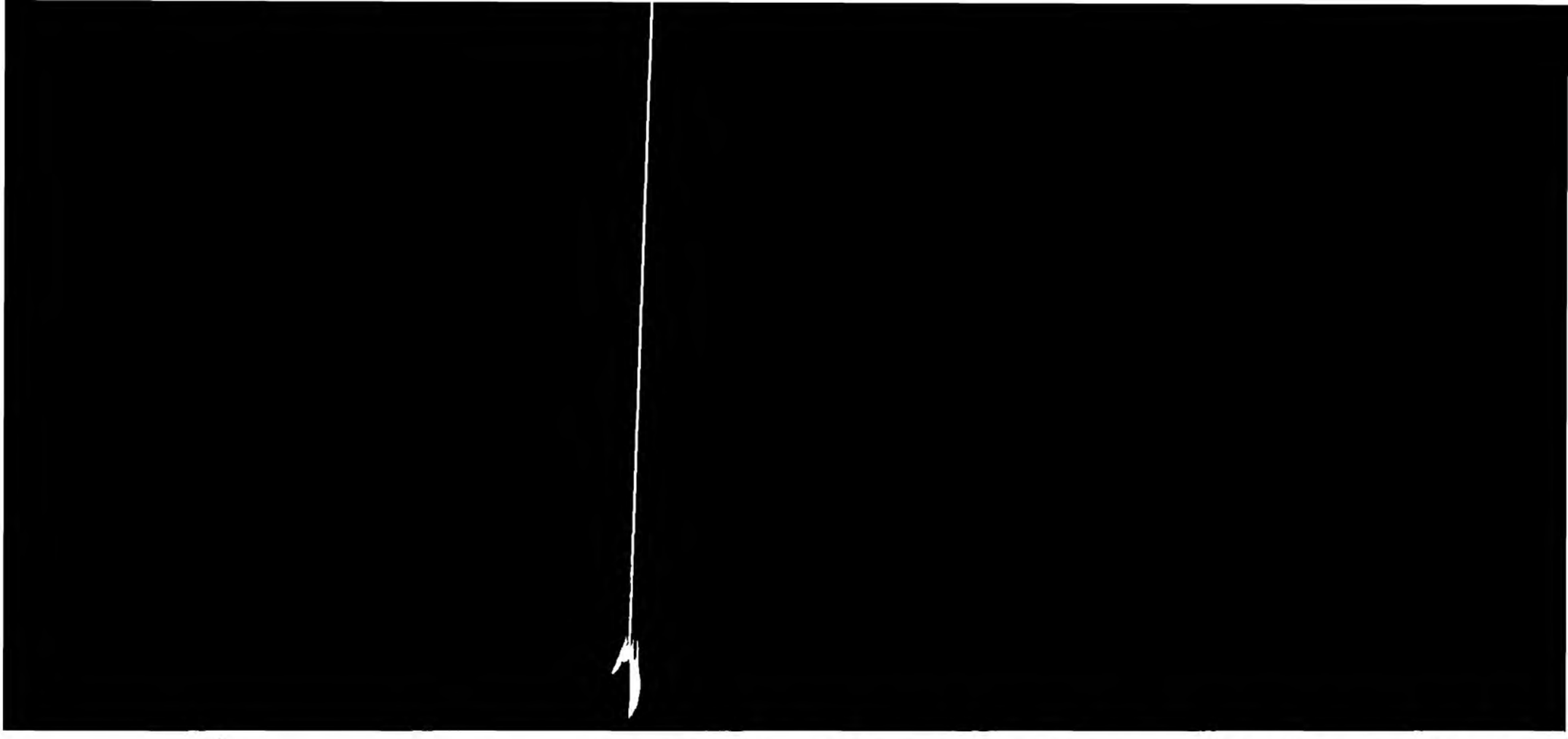

6. ASSESSMENT

A. PERSONNEL ARRANGEMENTS

1. EMERGENCY OFFICERS

i. Four out of ten regions have yet to appoint a dedicated Emergencies Officer (Southern, Northumbria, Welsh and Yorkshire). Of the remaining six, four are new or relatively new appointees (South West, Wessex, North West, and Thames). Only two NRA regions then, have had dedicated Emergencies Officers since vesting (Severn-Trent and Anglian).

ii. Of the existing Emergencies Officers, only one (Severn-Trent) is independent of the functions he serves. In all other cases, (less Thames, where he is subordinate to the River Control Manager), the officers are subordinated to the Flood Defence and Warning Departments. This has several implications. Firstly it reflects an erroneous perception (possibly a legacy from the previous water authorities) that only floodings are proper emergencies, and secondly it encourage the flood warning and defence senior managers to 'poach' the services of the Emergencies Officer and to use him as another element in their department. Thirdly, it restricts the initiative of the Emergencies Officers whose reporting chains and budgets are necessarily tied to the flood warning and defence departments. Fourth, and lastly, it hampers Emergencies Officers from presenting themselves as 'neutral' figures, offering impartial advice and policy.

iii. The first point which must be addressed then is the status and position of the Emergencies Officers. Two solutions are recommended: either regions model themselves on the Severn-Trent example, or all regions (including Severn-Trent) model themselves according to County Council practice.

iv. In the former example, the Emergencies Officer is subordinated to the Services Manager, a broad administrative function, and is financed by charging a precept on the budgets of the functions which he serves (flood warning and defence,

environmental quality, and fisheries). This arrangement is reportedly very successful and allows the officer to liaise directly and effectively with each of the three functions, who in turn can taken complaints, problems and suggestions directly to him. Effectively, the Emergencies Officer has a customer relationship with the departments and he measures his performance on the good service which he provides to them, and indirectly to the real customers - the general public.

v. The latter (County Councils) maintain Emergency Planning Officers and teams which report directly and independently to the County Council leader. This reflects both the importance which County Councils accord to the emergencies function and the recognition that the head of an organisation is ultimately responsible for the operational response of that organisation in an emergency. If this model were transferred to the NRA regions, the Emergencies Officer would report directly to the Regional General Manager (budget arrangements would remain as established in Severn-Trent). This arrangement offers many clear advantages. Firstly, the Emergencies Officer would have 'clout'. Secondly, as a result, departments would adopt a more positive attitude towards emergencies procedures and to procedures in general. Thirdly, the Regional General Managers would become aware of emergency procedures and of their organisation's performance following significant incidents. And lastly, the Emergencies Officer would be established as a 'neutral' figure, independent of the functions he serves.

vi. As a minor point, of the existing officers, only one (Wessex Region) is not directly responsible for the management of the Regional Communications and Control Room. As the Regional Rooms are central to an emergency response, it is incompatible that the Wessex Emergencies Officer should be divorced from the controllers. Placing the Wessex Rivers Control Room under the control of the Emergencies Officer would bring the region in line with the remainder of NRA regions.

vii. Of the regions without a dedicated Emergencies Officer, three expect to appoint one in the near future (Southern, Welsh and Yorkshire), and the last

(Northumbria) recognises the requirement for such an officer, but is deferring the decision to appoint an officer until the completion of a move to new premises in 1993 and the completion of the Tees Barrier in 1994. Given the small size of the region, and the adequacy of existing arrangements, it is recommended that this decision is respected.

viii. Lastly, there is currently no forum for discussion on emergency related issues between regions. This is in the main due to the relatively new appointments of the Regional Emergencies Officers and other priorities. Nevertheless, the majority of regions have reached a stage where Emergencies Officers have addressed the principal issues but the knowledge and experience they have gained are not being shared.

ix. It is recommended therefore, that an annual meeting of Emergencies Officers be established under the chairmanship of either the national Director of Operations. The forum should address the following broad points:

a) National communality in emergency procedures.
b) Regional cooperation, specifically in manpower and equipment resources.
c) Exercises.
d) NRA cooperation with external agencies in emergencies.
e) The roles of regional communications centres in emergencies.

2. CONTROLLERS (24 HOUR COVERAGE)

i. Of the ten NRA regions, five provide 24 hour coverage using external staff and arrangements other than the use of a regional communications centre.

ii. Of the five, one (Southern) currently relies on Plc Control Rooms, but is intending to establish a fully manned regional communications centre at the beginning of September; one (Welsh) is about to replace contract staff with NRA employees; and the remaining three (North West, Yorkshire and Northumbria) intend to

retain or modify existing arrangements. These are the BT Bristol service (to be replaced with contract staff) Defenco and Group 4 security group respectively.

iii. The alternative arrangements run by the three aforementioned regions are extremely cost effective and generally provide as good a service as those regions with NRA controllers. The only criticism which can justifiably be made is that the NRA is not being represented by NRA employees. However, this has no practical implications and is not sufficient reason to change existing arrangements. It is recommended therefore that the decisions taken by North West, Yorkshire and Northumbria Region are respected.

3. DUTY ROSTERS

i. Duty rosters are essential to a rapid operational response in an emergency. The ten NRA regions vary in what roster systems are considered to be acceptable with some regions maintaining 24 hour, weekly rosters from manager level downwards, and others only maintaining area level duty personnel in out of office hours. The principal criteria guiding a region's choice appears to be cost. Simply, some regions are unwilling to accept the additional costs incurred by putting more staff than is necessary on duty pay.

ii. This argument was accepted and unless it can be proved that the existing duty rosters are inadequate (they are not, with the exception of two regions), then it is recommended that regions are allowed latitude on this issue. The minimum acceptable is one duty Water Quality Officer or equivalent per area and one duty Flood Warning Officer per area during out of office hours. Every region, less the two exceptions, fulfil this requirement.

iii. The two regions which do not fulfil even this minimum requirement are North West and Southern. The former has no Water Quality Office duty roster for out of office hours and Bristol BT service call operators are required to use a cascade call out system until an officer is successfully contacted. It was reported that there

were occasions when the BT telephonists exhaust the available list of Water Quality Officers and resort to reporting pollution incidents to Flood Warning Officers. This clearly is unacceptable - if a major pollution incident were to occur during out of office hours, North West Region, potentially, could cause serious embarrassment to the region and to the NRA as a whole.

iv. Southern Region currently has no formal flood duty officer and Plc controllers who currently monitor telemetry alarms on behalf of the region are required to use a cascade call out system until an officer is successfully contacted. There were no reported instances when Plc controllers have been unable to contact a relevant officer but it was acknowledged that the system was unsatisfactory. This arrangement is expected to change in the near future with the appointment of area Flood Warning Duty Officers.

v. In both cases, the issue has been duty pay. It is recommended therefore that North West Region (Southern have resolved the issue) is given direction to resolve duty pay arrangements at the earliest opportunity and that the proposed minimum NRA standard is met.

4. EMERGENCY PLANNING FORUMS

i. Two regions currently run Emergency Planning Groups (Thames and Welsh). These groups meet quarterly and provide a useful forum for discussion of emergency related matters.

ii. The Thames Region Emergency Planning Forum terms of reference provides a good example of the breadth of topics which such groups may examine:

a) To review emergency planning arrangements and emergency preparedness within the Thames Region.

b) To review risks for which emergency plans should be provided.

c) To encourage satisfactory emergency planning arrangements.

d) To recommend improvements in the nature, scope or content of emergency plans.

e) To consider the national emergency planning issues as appropriate.

f) To ensure support for the work of the emergency planning group in catchment control.

g) To report at six-monthly intervals to the Regional Management Team on the adequacy or otherwise of regional emergency planning arrangements.

iii. The group additionally examines 'near-miss' incidents and uses the lessons learnt to modify existing procedures. Membership includes senior representatives from each of the principal functions (flood defence, fisheries and water quality) and the Regional Emergencies Officer.

iv. It is proposed that all NRA regions establish equivalent groups with the addition of PR representation. In this manner, regions would have a ready and regular mechanism for reviewing the emergency function and for examining past significant incidents on a multi-disciplinary basis.

B. PROCEDURES

1. OPERATIONAL MANUALS

i. All ten NRA regions have procedures, formal and informal, to deal with flood warning/defence, pollution and fisheries emergencies. There is a difference in the comprehensiveness of these procedures and this reflects the size, levels of activity, types of incident, and procedural and structural arrangements within each region. It is difficult therefore to assess unreservedly that one set of procedures are better

than another, each must be judged within the context of the region.

ii. However, some factual observations can be made. Four regions have yet to produce a Regional Emergencies Manual (Southern, Welsh, North West and Northumbria). Of these regions, Welsh also have no flood defence manuals, and North West have no pollution manual. Procedures do exist but they are informal and the Emergencies Officers or equivalents recognise that procedures must be formalised. In addition, two regions are in the process of re-drafting both the regional and specialised manuals (Southern and South West). Over one third of the NRA regions therefore, still have no formalised regional emergency procedures.

iii. Secondly, although there is an acknowledged and necessary difference in the contents of the regional manuals, there is also a qualitative difference. Simply, some manuals are better presented, better rationalised and as a result are both more user friendly and more likely to be used.

iv. It is recommended therefore that a national audit of manuals be undertaken. The audit should broadly address the following points:

a) Providing assistance to those regions who have yet to produce manuals using existing examples and probably manpower.

b) Selecting the best formats from each of the manuals with a view to producing standardisation and communality between the regions.

c) Integrating the proposed new manuals with the proposed new national liaison arrangements.

2. REPORTING PROCEDURES

i. All ten NRA regions have implemented satisfactory reporting procedures in the

event of emergencies. Only two regions, however, have established a daily regional reporting system which is multi-disciplinary and which encompasses all but the most minor incidents.

ii. Anglian region use a daily status report system based on overnight manual collation by the communications centre's staff of all but the most minor incidents recorded in the previous 24 hour period. Wessex Region use a daily reporting system based on significant incidents submitted by the principal departments to the Regional General Manager's office and also covering the previous 24 hour period. The dissemination of these reports is wide and both regions agreed that a multi-disciplinary reporting system is a valuable and efficient means of encouraging a sense of corporate identity and allowing departments to keep abreast of the daily business in the region.

iii. Although such reporting systems do not strictly have an emergency application, their overall value is such that it is recommended that all regions examine the feasibility of establishing daily reporting systems based either on the Wessex or Anglian models or of their own design. In the event of an emergency or significant incident, the mechanisms would already be in place to ensure that all departments within the region were kept informed of the incident.

iv. Secondly, one region (Wessex), already has in place mainframe computer links which allow electronic logging of incidents coupled with an electronic mailing facility, and three further regions (Welsh, South West and Yorkshire) are examining the feasibility of introducing such systems on existing hardware (the CEO, computerised electronic office system, and vax PC system respectively). Effectively any reported incident can be logged and the results of the investigation be recorded, electronically, and any remote user of the system can access the information.

v. This clearly is the future of reporting procedures and such systems would render obsolete the verbal, manual and facsimile-based reporting chains which the regions currently use. Further, in an emergency situation, all interested parties would be

able to instantly keep informed of the progress of the incident. Lastly, a daily reporting system could be integrated into such an electronic logging and mailing facility.

vi. It is proposed therefore that a feasibility study be conducted to determine the following broad points:

a) How many regions have hardware in place, which could be adapted for electronic logging and mailing on a regional, multi-disciplinary basis?

b) How many of the regions in the above category would require enhancements, whether quantitative (number of PCs), or qualitative (number of links), to make the systems fully regional and multi-disciplinary.

c) How many regions neither have appropriate hardware nor the necessary mainframe links to establish regional, multi-disciplinary logging and mailing systems and would require new systems?

d) The costs of achieving the above.

vii. The proposed project does not have urgency but it is reiterated that electronic logging and mailing is the future of communications within large, national corporations.

3. FLOOD WARNING DISSEMINATION PROCEDURES

i. The Flood Warning and Defence Departments are generally the best organised in NRA regions, boast the most sophisticated technology and are justifiably proud of the professional service they provide. However good the warning service, dissemination arrangements remain inadequate, a fact recognised in the recent flood defence managers' meeting held 16th/17th April 1991. 'Investigatory work in two regions had revealed that a very low percentage of people affected by

flooding had received a warning from either the police or the local authority'. Worded bluntly, an expensive and highly professional service is being wasted.

ii. There are reasons for the inadequate dissemination arrangements and these were discussed at the meeting: police overstretch, resource problems within local authorities, and the possible move to unitary authorities in the near future. The importance of establishing the NRA's role was also noted:

'It was emphasised that the prime responsibility for dissemination of warnings rested with the police and it was recognised that there were dangers attendant upon the NRA bypassing this established relationship. It could, for instance, encourage both the police and local authorities to attach less significance to their flood warning responsibilities, implicitly transferring this responsibility to the NRA and, at the same time, increasing the liability of the authority.' However, for the NRA to take the attitude that it is fulfiling its role while ignoring that its service, while gratifying to hydrologists, is not equally gratifying to the members of the public whose properties and lands are flooded without warning, remains unsatisfactory. Further, to effectively leave the problem in the hands of the police and local authorities is also unsatisfactory - neither have the initiative or resources to find solutions in the near term.

iii. Can the NRA contribute to the successful dissemination of flood warnings without altering existing relationships and concomitantly increasing its liability?

iv. The two regions which undertook surveys to determine the efficacy of flood warning dissemination procedures, South West and Severn-Trent, have both subsequently undertaken initiatives to improve the service without altering the NRA's essential role as flood warning service. In the former case, farm watch and neighbourhood watch groups as well as fire brigade operations centres have been included in a flood warning dissemination network. In the latter case, a flood warden network which has already been operating successfully in three counties, is being extended regionally and is supported by a voicebank flood warning service. Ordinarily the voicebank, located in the communications centre, provides

a fisheries information service (the so-called 'riverline'). During periods of likely or actual flooding, the 'riverline' is used as a flood warning service (it might be noted that the voicebank is based on an (0898) number and is financially very renumerative). Severn-Trent testified to the success of both the flood warden and voicebank services.

v. Two regions then have taken the initiative and have demonstrated that supplementary methods of getting flood warnings to the public can be implemented without altering existing responsibilities. These methods represents, in fact, the second recommendation which was agreed upon in the flood warning review of operational procedures:

'b) Supplementary methods of getting flood warnings to the public should be encouraged where these do not interface with or dilute established dissemination procedures.'

vi. Three courses of action are proposed:

. All remaining NRA regions should examine the feasibility of establishing a flood warning voicebank service based on the Severn-Trent example.

. All remaining NRA regions, in coordination with the local authorities, should examine the feasibility of establishing flood warden networks. The NRA Regional Emergency Officers and County Emergency Planning Officers should be involved in coordinating the networks at local level, and high risk areas should first be targeted. Again, the experience gained by Severn-Trent may prove useful in determining in detail how best this might be achieved.

. All NRA regions should cultivate links with local radio with a view to disseminating flood warnings via this medium.

. These services should be introduced, not before the respective roles of the

NRA, Police and local authorities have been mutually agreed as the flood warning review suggests, but before, as a demonstration of initiative and goodwill on the part of the NRA. In this way, the apparent deadlock may be broken and the flood warning service be improved. While not culpable for the poor dissemination, neither should the NRA eschew any initiatives which might improve that dissemination.

4. COASTAL POLLUTION EMERGENCIES

i. The NRA regions universally expressed disquiet over arrangements in the event of coastal pollution emergencies. Simply, the problem is one of overlapping agencies with overalapping legislative responsibilities. The NRA has a statutory responsibility to monitor water quality and salmonid fishing up to 3 nautical miles offshore and to deal with pollution incidents if onshore or inland based. The Marine Pollution Control Unit (MPCU) exercises central Government's responsibility for dealing with pollution which is caused, or threatened, from about 1 mile from shore, where it threatens coastal pollution and where it would be advantageous to disperse whilst it was still at sea, without harm to fisheries or other interests. Lastly, shore pollution on beaches or other coastal areas, remains a local authority responsibility. The problem is that pollution does not oblige legislators by remaining inside defined categories. More often than not, oil spills or other forms of pollution spread to all three agencies' areas of responsibilities as well as to the 'grey areas' where none is clear as to who should be taking the lead.

ii. A quote from the pollution plan of Lancashire Region's MCPU (and not to be read as national policy) exemplifies present areas of uncertainty.

'This plan is intended to be brought into operation only in the event of a major incident affecting the Lancashire coastline. Minor incidents will be dealt with within the day to day normal procedures of the respective authorities.'

Who decides when an incident is major or minor? Can the other 'respective authorities' adequately deal with minor incidents anyway? (NRA North West Region do not hold sufficient stocks of booms to protect any of the major estuaries on their coastline, although it is acknowledged that booming an entire estuary is a rare and often impossible operation).

iii. The plan continues:

'The MPCU will not cease operations even within one mile of any shore if operations have been further out to sea and provided there is sufficient depth of water for the vessels employed by the MPCU to operate.'

This caveat allows MPCU units to operate inside the areas of responsibility normally accorded to the NRA. Who controls the operation? Are procedures for MPCU - NRA cooperation in such cases clear and practised? And what are the procedures in the reverse case - when inshore based pollution threatens to extend and lead to coastal and offshore pollution?

iv. On this latter point, for example, NRA regions gave varied responses. North West Region reported good cooperation with the Lancashire MPCU in a recent incident which originated from within the NRA's area of responsibility but which required the use of MPCU resources. South West Region, by contrast, reported an unwillingness on the part of the local MPCU unit to assist the NRA in an estuary based pollution incident on the grounds that it was outside their area of responsibility. Clearly, arrangements for cooperation between agencies should not rest on personal preferences or on personalities.

v. Overall, then, the national arrangements for dealing with coastal pollution emergencies contain ambiguities and in practice can be unsatisfactory. The problems specific to the NRA appear to be liaison arrangements with the MPCU in the event of emergencies, and a general lack of booms and associated equipment to adequately deal with all but minor pollution incidents.

vi. Several courses of action are suggested:

- All NRA regions should compile an inventory of boom and related equipment, coupled with a coastal pollution plan specific to the region describing accurately the coverage that can be achieved with the existing equipment. Copies of all ten coastal pollution plans should be submitted to the Director of Operations at National Office.

- A Memorandum of Understanding or similar document should be agreed between the NRA and MPCU (if such an agreement already exists, regional staff are unaware of its contents). The NRA must gain agreement to MPCU assistance in the event of coastal pollution incidents of onshore or inland origin for which the NRA has insufficient resources. Issues of control, authorisation, liaison, communications and costs should be included in this document.

- Local authority involvement may not be necessary but these should be made aware of any changes to existing arrangements.

C. EMERGENCY CONTROL FACILITIES

1. COMMUNICATIONS CENTRES

i. Regional communications and control arrangements continue to be addressed by a variety of arrangements. Five regions have dedicated regional communications and control rooms (South West, Wessex, Thames, Severn-Trent and Anglian). Of these; two are co-located with flood warning rooms, probably the 'nearest' solution (South West and Wessex); one has flood rooms at catchment area level (Anglian); one has two flood rooms in a western and eastern area division (Thames); and one has a separate flood room at the Regional Headquarters (Severn-Trent). All five communication and control centres nonetheless monitor telemetry as a secondary function.

ii. Of the remaining five regions, one is about to establish a regional communications and control centre and joint flood room (Southern); one is intending to enhance reception area personnel arrangements (Welsh); one is intending to establish a communications and control room in the near future and abandon the existing BT service call arrangement for out of office hours (North West); one is resisting any changes to existing arrangements with Group 4 security group until the planned move to new premises in 1993 and the completion of the Tees Barrage in 1994 (Northumbria); and one is intending to retain existing arrangements with Defenco Security Company (Yorkshire).

iii. Those regions without communication and control centres justify their alternative arrangements on two principal criteria: cost and necessity. An examination of the alternative arrangements has proved that these criteria are justified. It is recommended therefore that regions are allowed some latitude on this issue and that alternative arrangements, where viable are respected.

iv. Secondly, it should be noted, by way of warning, that the automation of communications and telemetry technology will increasingly render the human operator redundant. Those regions with fully staffed communications centres may find at a later date that staff have little to do other than man a switchboard and undertake administrative tasks and that these tasks can be undertaken equally well by contract staff at a much lower cost. The issue of whether or not to establish fully manned regional communications centres is problematic and it is recommended that the long-term impact of improving technology is considered before any future policy decisions on this matter.

2. TELEMETRY

i. The ten NRA regions maintain varied telemetry systems. The reasons for these variations are largely historical and need not be examined. Broadly, systems have evolved to suit the needs of the region and it is recommended that this practice is respected.

ii. This point can be expanded: there is no overwhelming justification for a national standardisation of telemetry systems, indeed the reverse argument is stronger. Secondly, there is no absolute argument supporting the establishment of the most sophisticated technology and software available in every NRA region. The basic system used by Northumbria, for example, entirely suits its needs. Nonetheless telemetry technology and software has developed significantly in the last decade and the experience gained in this field should not be wasted.

iii. Two points therefore may be made. Regions are currently pursuing telemetry development independent of each other with the result that knowledge is not being shared and costs, almost inevitably, are higher. Secondly, in the cases where regions are looking to replace hard and/or software, solutions are not being sought across the NRA but independently within the regions (South West, Anglian and Thames fall into this category).

iv. It is proposed therefore that a review of existing telemetry systems should be undertaken. It is recommended that the review be led by Severn-Trent and Yorkshire hydrology staff on the basis that these two regions probably run the most sophisticated telemetry systems available in the NRA. It is stressed that this appointment should not be viewed as encouragement to establish Severn-Trent or Yorkshire Region's systems nationwide - this simply is not necessary - but is recommended solely on the basis that the expertise does lie with these regions and that 'in-house' talent should not be wasted.

v. The review should address the following points:

a) A replacement for Anglian Region's outdated telemetry monitoring system (both hard and software). It was reported that such a replacement, currently, may cost as much as £6 million. A partial or complete borrowing of existing technology may result in considerable cost savings.

b) A replacement for South West Region's 'Wang' hardware. The region reported the hardware to be unreliable to the extent that the flood warning

service may become inefficient in the near future. The replacement of existing hardware may be used as an opportunity to concurrently review existing software.

c) An assessment of Thames Region's western area telemetry systems. Currently a mix of systems are being used (alarm telephones, manual readings, radio and PSTN). It was reported that the PSTN lines recently introduced in the Weyton area would probably overtake the other systems. It may therefore now be appropriate to review the complete system using external experts.

d) An assessment of all remaining regional telemetry systems with a view to sharing knowledge, providing advice and suggesting possible enhancements.

e) The future establishment of a telemetry working group, with a membership comprising regional hydrology staff, which would periodically review developments in this field and share knowledge and experience.

D. COMMUNICATIONS

i. Communication systems vary between the ten NRA regions. The reasons for these variations are largely historical and need not be examined.

ii. As an overview, three regions rely solely on cellular telephones and have no radio network (South West, Severn-Trent and Northumbria); four regions use cellular telephones and share a radio network with the Plc water authorities (Southern, Yorkshire, Wessex and North West); one region uses cellular telephones and relies wholly on Plc control rooms for radio communications (Welsh); and two regions use cellular telephones and have integral radio networks (Thames and Anglian). Future plans similarly vary with the majority of regions intending to opt for shared trunk PMR with the Plc water authorities, supported by cellular telephones. Severn-Trent is a notable exception and has no current plans for

establishing a radio network; Thames and Anglian may opt for integral trunked radio. Southern Region may opt for band 3 citizen radio.

iii. Two points need to be made. Firstly, no region's communications are so vulnerable that the region would be unable to cope in an emergency in which the communications network were also partially or even significantly disabled. Even in the case of those regions which rely on one means (cellular telephones) both the quantity of units in use and alternative communication means that the region could communicate, however haphazardly. Indeed only a catastrophic scenario involving a complete loss of telephone links and all cellular telephone facilities would place those regions in a position where they would be unable to respond - presumably such a catastrophe would have wider origins than a purely water related emergency. Nonetheless, reliance on one communications means does place stress on that system and cellular telephones in particular can become over-used.

iv. The example of Severn-Trent is worth quoting at this stage. The region, possibly the busiest in the NRA, relies exclusively on cellular telephones, assesses the system to be entirely reliable, and reportedly has no future plans for establishing a backup radio network. The case therefore, which states that cellular telephones are both unreliable and vulnerable, does not appear to be supported by at least one notable example.

v. The second point is that the majority of regions are opting for shared trunk PMR with the Plc water authorities, supported by cellular telephones. This general trend has been encouraged by National Office but is not policy - effectively then, regions are independently finding long term solutions to their communications networks of the future. It may therefore, now be appropriate to establish a national communications policy to draw together the separate initiatives being taken by the regions. It is understood that national communications are a subject under review and that the topic does not fall exclusively into a review of emergency procedures. The following notes are offered as an overview but no recommendations are made.

vi. It is recommended that a national communication policy should have three elements:

- telephone communications
- radio communications (trunked PMR)
- cellular telephone communications

The guiding criteria behind the policy should be twofold:

- national communality
- regional redundancy

vii. These points are now taken in order:

a) Telephone Communications

Several regions are introducing mainstream direct link telephone (ISDX) effectively providing an internal telephone network outside the STD network. This should be extended to all NRA regions and would integrate with trunked PMR. Communications would then be possible nationwide, vehicle to vehicle, vehicle to portable, vehicle to NRA telephone ISDX network, and portable to NRA telephone ISDX network.

b) Radio Communications

All regions should introduce trunked PMR as the primary regional communications system. It is recommended that NRA regions integrate with the proposed water authority networks which should be established over the next 5 year period. This would allow considerable cost savings and integrate the NRA into the national frequency plan. Failure to join the new trunked PMR systems would result in considerable financial penalties if that decision were later to be revoked. It may also result in difficulties over the negotiation of frequencies.

c) Cellular Telephone Communications

All regions, as policy, should continue to use cellular telephones as a secondary regional communications system. Cellular telephones would provide redundancy and allow users to access the BT network. This latter characteristic is not available with trunked PMR and remains important to fisheries and pollution staff whose activities frequently require communications with external agencies.

d) National Communality

An ISDX telephone network, coupled with a trunked PMR network which is integrated into the national frequency plan, and supported by a network of cellular telephones, would provide the NRA with nationwide communality. This would permit greater flexibility in inter-regional cooperation and would offer advantages in a major emergency requiring the mobilisation of resources nationwide.

e) Regional Redundancy

Notwithstanding the example of Severn-Trent, it is recommended that redundancy should be available at regional level. It is conceded that a simultaneous total collapse of STD telephone and cellular telephone links is very unlikely but the risk of embarrassment to the NRA is assessed as unnacceptable. The establishment of primary trunked PMR networks supported by cellular telephones would eliminate this risk and ensure a rapid NRA response to emergency in cases where communications networks themselves are affected. Overuse of cellular links (by media users) would also be bypassed.

E. EXERCISES

i. Few NRA regions have implemented exercises as part of their annual programme of events. Several reported taking part in exercises run by other authorities or private companies (usually in the oil-related industries), and a number reported

that exercises would be run in the future. Overall, however, the NRA regions remain 'exercise shy'.

ii. The problem seems to be twofold. Firstly, there is evident resistance from staff at the operational level who question the value of exercising roles and rasks which are practised on a daily basis anyway. This point cannot be ignored: exercises which achieve little more than distract from routine work to practicse tasks which might have been performed anyway in real situations, will only succeed in alienating the operational staff. Underlying this resistance may also be the albeit unjustified perception that operational staff are being 'tested;, and with it the implication that the testing is necessary because 'they [management] think there is something wrong with the way we do things at the moment.' Both these points can be answered: exercises should test the extraordinary not ordinary, and secondly, every tier, from managers to Pollution Control Officers, should have involvement.

iii. The second half of the problem appears to be a lack of experience in running exercises. Those emergency officers, for example, whose previous professional backgrounds are military or related to the emergency services, were noticeably more confident over setting up and running an exercise, than those officers without such a background. Again this point can be addressed: officers without experience can use the expertise of those who have it, and in the first instances 'borrow' exercises previously run in other regions.

iv. A third point may also be made: although the regions are aware that 'we've been told we must carry out exercises', they remain vague over the details. A directive from National Office would clarify the situation. Such a directive might include the following broad points:

- A statement to the effect that exercises involving all tiers of regional staff must be run bi-annually. One exercise must be related to a pollution incident and one must be flood related.

- A statement as to why exercises are necessary. Implicit in this statement are those aspects of the NRA's operations which should be tested regularly: individual roles and responsibilities, emergency procedures, reporting chains, the rapid deployment of staff and equipment, communications, and liaison with external agencies.

- A statement of the principles of exercises. These might include:

  - a clear aim
  - an imaginatve scenario
  - thorough preparation and planning
  - maximum participation
  - an element of difficulty
  - an element of the unexpected
  - good control from directing staff
  - the use of umpires
  - post-exercise debriefs
  - post-exercise reports
  - the implementation of 'lessons learnt' into existing procedures

- Other points which should be addressed in the directive might include:

  - National Office participation. National Office observers should be invited to the regional exercises, in addition to the role played by National Office as reporting centre.

  - Regional cooperation. Exercises might include regional cooperation both in staff and equipment. This might be realistically achieved by staging exercises on or near regional boundaries or by setting scenarios which require the deployment of significant amounts of equipment (booms, for example). The use of umpires from other regions should also be encouraged as a means of ensuring neutrality and of improving knowledge of other regions' procedures.

External participation. Local authorities, the emergency services and private businesses should be encouraged to participate in NRA exercises. This would both improve liaison between the various agencies and encourage reciprocal arrangements.

PR participation. Exercises make good publicity - almost, it might be conceded, at the expense of day to day operations which go unnoticed - and should be exploited by inviting media coverage. A one minute piece, for example, showing the running of the regional control and communications centre watched by millons of viewers and local television news, can achieve more in promoting the NRA than thousands of publicity leaflets or anonymous telephone numbers in 'The Yellow Book'.

2. RAYNET

i. Raynet is the British Amateur Radio Association. At least two regions have used Raynet (Yorkshire Region in the recent February floods, and Severn-Trent in a communications exercise). Both regions described the service offered by Raynet as 'excellent'.

ii. It is recommended therefore, that all NRA regions establish links with Raynet and that the association are invited to partake in NRA exercises, establishing a basis for future cooperation in real incidents.

F. EQUIPMENT

i. No region reported outstanding equipment deficits which would significantly affect their operational responses to emergencies. The only exception to this general rule are the regional stocks of booms and skimmers, see Section 4 Coastal Pollution Emergencies. Nonetheless, some regions are better equipped than

others and the degree of reliance on local contract arrangements to make up manpower and resource deficits vary from region to region.

ii. It is understood that a separate study has been undertaken on equipment holdings in the NRA and that the report broadly drew the conclusion that there is no requirement for specific emergency equipment holdings. This report therefore makes no recommendations on equipment.

G. FINANCES

i. No region reported financial constraints which might affect their operational response to emergencies. The majority of interviewees, however, confessed to no knowledge of emergency reserve or slush funds and were ignorant of procedures relating to unforeseen expenditures. The most common attitude expressed was 'spend what you have to and answer the questions later'. While giving staff a welcome and often necessary measure of laissez-faire, it is suggested that guidelines for unplanned expenditures should be better know. This would benefit both new or inexperienced staff and would clarify financial arrangements in those cases where the NRA is required to cooperate with external agencies.

ii. It is recommended therefore that all regional operational manuals include a financial section addressing the following broad points:

a) Emergency reserve or slush funds (if they exist) within each department.

b) Unforeseen expenditure procedures including authorisation codes, responsibilities and spending ceilings.

c) The recording of unforeseen expenditures on a formal incident audit sheet.

d) NRA financial liabilities when cooperating with external agencies (local authorities, harbour authorities, MPCU, MAFF etc).

e) NRA cost recovering procedures.

iii. It is recommended that the financial departments within each region produce the guidelines both in aide-memoire form for operational staff, and fully, for reference in regional emergency manuals.

7. RECOMMENDATIONS

It is recommended that:

7.1 The national 'Emergency Liaison Arrangements' be re-written as two documents; one outlining procedures for the NRA regions, and one outlining procedures for National Office and Thames Barrier staff. The new documents must clearly answer the question 'what is an emergency?' and provide a statement of the National Office role.

(See Section 4 all paras).

7.2 Emergency Officers are subordinated either to an Administration/Services Manager or that they report directly to Regional General Managers as a separate function. Whichever option is chosen, the principle of independence from core functions should be observed.

(See Section 6. A.1).

7.3 (Minor recommendation). The Wessex Region Emergencies Officer manage the Rivers Control Room and staff. This would bring the region in line with other regions where Emergencies Officers, logically, are responsible for communication and control rooms and staff.

(See Section 6.A.1. vi.).

7.4 (Minor recommendation). The decision by Northumbria Region not to appoint a dedicated Emergencies Officer before 1993/94 be respected. Northumbria will shortly be the only NRA Region without a dedicated Emergencies Officer.

(See Section 6.A.1. vii.).

7.5 An annual meeting of Regional Emergency Officers be established under the chairmanship of the National Director of Operations.

(See Section 6.A.1. vii.-ix.).

7.6 The alternative 24 hour coverage arrangements used by North West, Northumbria and Yorkshire Regions (BT Bristol service call, soon to change to contract staff, Group 4 security group, and Defenco respectively) be respected.

(See Section 6.A.2).

7.7 North West Region is given direction from National Office to resolve its pay dispute over duty Water Quality Officers, and that duty water quality rosters per area, are implemented at the earliest opportunity.

(See Section 6.A.3).

7.8 All NRA regions establish emergency planning forums. The forums should ideally meet on a quarterly basis and include representatives from the core functions, PR and the Emergencies Officer.

(See Section 6.A.4).

7.9 A national audit of emergency operational manuals be undertaken, possibly to run concurrently with the proposed annual meeting of regional Emergencies Officer, with a view to establishing high standards and communality between the regions.

(See Section 6.B.1).

7.10 All NRA regions examine the feasibility of introducing daily, multi-disciplinary reporting procedures (on the Anglian or Wessex model). Although these do not have a strict emergency application their overall value is recommended.

(See Section 6.B.2).

7.11 A feasibility study be conducted to determine the availability and capabilities of electronic logging and mailing systems within the regions and the costs of enhancing present systems and introducing new systems.

(See Section 6.B.2).

7.12 All NRA regions examine the feasibility of introducing flood warning voicebank services, flood warden networks and exploiting links with local media to improve existing flood warning dissemination procedures.

(See Section 6.B.3).

7.13 All NRA regions draft coastal pollution plans giving current coverage available with booms and associated equipment.

(See Section 6.B.4).

7.14 A Memorandum of Understanding be established between the NRA and MPCU to promote closer, formalised cooperation in the event of coastal pollution incidents.

(See section 6.B.4).

7.15 Regions are allowed latitude on whether or not to establish regional communications centres and that those regions which have chosen alternative arrangements have their decisions respected.

(See Section 6.C.1).

arrangements have their decisions respected.

(See Section 6.C.1).

7.16 A review of existing nationwide telemetry technology be undertaken by a Severn-Trent and Yorkshire led team. Secondly, that a telemetry working group be established to encourage closer cooperation and sharing of knowledge between the regions.

(See Section 6.C.2).

7.17 All NRA Regions implement a bi-annual exercise programme: one exercise should be pollution based and one flood defence based. All tiers of staff should be tested and those regions without experience in running exercises should seek it from regions with the experience.

(See Section 6.E.1).

7.18 All regions establish links with Raynet, the British Amateur Radio Association, and invite Raynet to partake in NRA exercises.

(See Section 6.E.2).

7.19 (Minor recommendation). All regional operational manuals contain a financial section outlining procedures for unforeseen expenditures in emergencies.

(See Section 6.G).

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