

THE FLOOD OF FEBRUARY 1990

TECHNICAL SERVICES
FLOOD MONITORING REPORT

Written by Duty Officers
T J Webb and D G Innes

ENVIRONMENT AGENCY



101994

TECHNICAL SERVICES FLOOD MONITORING REPORT

PERIOD 2nd February 1990 - 13th February 1990 : : :

WRITTEN BY: T J Webb and D G Innes (duty officers)

OBJECTIVES OF REPORT

To give a factual account of events.

To ensure that the data gathered is properly collated, indexed, mapped and distributed.

To enable lessons to be learnt and amendments to procedures made where necessary.

To ensure that the collective effort made by all those involved is recognised and that the positive issues are raised.

CONTENTS

1. Weather and Catchment conditions (extract from G M Merrick "Storm and Flood Report January - February 1990 Western Area".)
2. Effectiveness of Technical Services Flood Monitoring Systems - thoughts and recommendations.
 - 2.1 Additional Recommendations
3. Interactions with other groups
4. Public Relations Interface
5. Summary of actions
6. Duty Officer log(s)
7. Discharge and Level Data
8. Log of Aerial photography
9. Plans for use of data
 - 9.1 Proposed flood photograph index
10. Appendices of data

STORM AND FLOOD INCIDENTS: JAN-FEB 1990

WESTERN AREA

1. WEATHER & CATCHMENT CONDITIONS

A series of frontal systems resulted in persistent rainfall over the Thames area, from the 18th to the 21st January bringing the 5 station average for the month to 90.7mm, some 133% of the standard average. This gradual build up followed very wet December conditions when soil moisture deficits were eradicated by rainfall which was of the order of 227% of the monthly average.

Consequently, by the 31st January, the River Thames and many of its tributaries were brought to just above a "typical low flood level".* Without respite, weather conditions deteriorated into February when a more vigorous depression affecting the whole of the Catchment brought a further 40mm of frontal rain in the first 3 days of the month. Weather conditions remained very unsettled throughout the following fortnight with further rainfall on the 6th - 7th (accompanied by gale force winds) and again over the period 10th - 14th February.

Rainfall totals for February to the 14th were of the order of 88.1mm, some 176% of the standard average for the whole month, and 350% of what might be expected at this time of year, averaging on a daily basis.

* This term is used to describe bank full conditions with some local overtopping into flood plain, and might be expected to occur 2-3 times each winter, according to catchment/weather conditions.

This information has been kindly provided by G M Merrick. Further information is available in his full report "Storm & Flood Incidents: Jan-Feb 1990 Western Area".

(2) EFFECTIVENESS OF T.S.F.M.S. - THOUGHTS AND RECOMMENDATIONS

Whilst it will ultimately be for others to judge it is my opinion that the T.S.F.M.S. worked extremely well over the period. From my point of view this was due to two factors:

- 1) the quality of the manuals which when put to the test proved extremely comprehensive and well thought out.
- 2) the willing and effective support I received from all those members of staff I called out or requested information from.

It became apparent as time went on that in fact the T.S.F.M. Duty Office is perhaps more aware of the "overall situation", particularly regarding people out on the ground, than anyone else involved. This may therefore be a point to be emphasised to people to ensure that the T.S.F.M Duty Officer is contacted by any member of staff wishing to know what is going on. This will result in consistent information being issued.

During the course of events a number of points occurred to me for future improvement and I would RECOMMEND the following:-

- 1) It is essential that the role of the T.S.F.M.S. Duty Officer is clarified and understood. They have a key role on the effective coordination of the gathering of data and in the deployment of Tech. Services staff to provide additional help where ever it is required. To do this it is important that they themselves do not get too involved in specific tasks in the Flood Room. For instance if extra help is required for answering incoming calls the Duty Officer may very well be able to help out BUT he must judge whether this will impinge on his primary function and if necessary arrange for the extra help to be found.
- 2) The value of the mobile phone became more and more apparent during this event. Individuals out on the ground with phones were able to immediately report back as they arrived on site, could be redirected as required and could liaise with others they were working with. Those without were isolated and could only be used for jobs they had been briefed on prior to going out. I believe it is essential that we reassess the number of phones, batteries, charges, etc required to operate effectively during a significant event.
- 3) For ease of communication in the Flood Room it would be useful for markers to be placed on the Catchment Map indicating where Technical Services staff are out and about gathering information, and showing the location of all telemetry sites and gauge boards.

4) Few people were aware of the direct line for Technical Services calls - or at least found difficulty finding the number.

5) For those entering the Flood Room it is very difficult to quickly get a clear picture of what is going on. Particularly during busy periods with everyone on the phone. It would make life a great deal easier if a summary board was kept up to date with a current list of warnings, latest levels and flows, critical levels, and weather forecast and rainfall summaries. This would ease the burden on those already hard pressed in briefing those coming on duty.

6) Lists of contact names, weekend duty officers, telephone numbers and addresses preferably on a p.c. next to the telephone would assist, as would standard data/statistics regarding location of gauging stations, level recorders, times of travel, critical levels etc. Ideally this would be on a catchment basis and the data should be in consistent units.

7) Having a separate adjoining room to the Flood Room to be used, for plotting, planning and briefing away from the continuous incoming calls to the flood room would be very useful. This room could also be used by Public Relations and as a rest/recovery room! It is extremely difficult to carry out these activities in the Flood Room. To have the facility of switching the Technical Services line to either of these rooms would be the ideal, in general incoming calls would be best received on the Flood Room - outgoing calls made out of the Flood Room.

8) The red manual could be improved by rethinking the display of information relating to the list of call out staff (would be preferable to have in alphabetical order.), which catchments they cover and their home/office telephone numbers. This information together with the duty roster telephone list ought to be attached to the inside front cover of the file for ease of use.

Notwithstanding all this the overriding impression is that the systems and procedures did generally work well and that there was a great deal of enthusiastic and willing support provided by all those mentioned.

(2.) ADDITIONAL RECOMMENDATIONS MADE BY CALL OUT OFFICERS
(DEBRIEF HELD 19/2/90)

- 1) A set of clearly defined priorities are necessary for call out officers so they know what information is required in priority order.
- 2) It is essential that call out officers familiarise themselves with their catchment before an event if they are to be effective in a flood. Also that the gauge boards are levelled in and the safety aspects of reading them in a flood considered.
- 3) The maps in the manuals need to be up to date, and preferably include information relating to roads that flood and prevent access to gauge boards, and that have Byelaw flooded areas marked on. This would enable an immediate assessment to be made of the scale of the event.
- 4) Binoculars are of great value in reading gauge piles from a scale distance. Their use is recommended.
- 5) Feedback is required to Technical Planning from Flood Room giving information relating to the peak at trigger points. This would enable specific Appeal sites to be inspected at the peak.
- 6) It is recommended that where possible the SURVEY team shall be utilised during an event enabling flood levels to be recorded at the time and to use their knowledge of the catchment.
- 7) Aerosol spray markers provided were not successful and need to be rethought. The Maidenhead team have the solution. Those marks made during the course of the event should now be listed and levelled in.
- 8) An equipment coordinator officer should be nominated (to assist John Wills) in ensuring that sufficient supplies of film, batteries etc. are available.
- 9) The question of personal insurance for helicopter flights needs checking.
- 10) Several points were raised concerning the helicopter flights which are covered under section (2).

(3) INTERACTIONS WITH OTHER GROUPS

To achieve effective use of resources, to cover all the areas of interest it was necessary to maintain contact with the following for the reasons given:-

1. The Flood Room - exchange of information
- offer and organisation of Technical Services
Staff assistance as required by the Flood Duty Officers.
- to assist in taking incoming calls

2. Flood Defence Personnel

- i) Roger Powling, Colin Candish, Nigel Bray, Neil Watson
- to ensure maximum coverage of tributaries to gather Levels of Service information
- to use Technical Services resource to support Flood Defence staff for helicopter flights; level and extent of flooding information.
- to ensure other interests i.e. "Projects", "Technical Planning", were taken into account during site visits by Flood Defence staff.
- to ensure widespread understanding of overall monitoring operation and to encourage two way communication to assist Flood Room/Public Relations.
- ii) Operational Staff at Sunbury and Osney Yard Oxford.
- to offer Technical Services assistance
- to assess how best to deploy T.S. staff to maximum effect to prevent duplicate cover.
- to gain benefit of local knowledge of problems and sensitive areas.

3. Technical Services Personnel

- to ensure all areas of interest are covered especially Projects, Technical Planning, and Technical Support
- to ensure local knowledge to best effect and send the right people to the right places where possible.
- to redirect as necessary and to ensure the safety and well being of personnel called out.

4. Senior Managers/Sector Managers as judged necessary

5. Catchment Control

- to be aware of flood gauging works going on and to offer Technical Services assistance as required.

6. Public Relations

- to keep customer relations staff informed as much as possible to ensure the best information is available for the press/public.

It has been emphasised that for these interactions to be effective it must be a TWO WAY process. That is to say the T.S.F.M. Duty Officer has to rely on all those groups mentioned above to do their part and feed information to him. This certainly worked fairly well for me although there were problems due perhaps to a lack of understanding by others of the role of the T.S.F.M. Duty Officer.

THE FLOOD OF FEBRUARY 1990

(4) PUBLIC RELATIONS INTERFACE

A listing of television coverage and radio broadcasts is given in Appendix?

In addition to this it is estimated that over two hundred enquiries from the media were handled during the period Monday 5th February to Wednesday 7th February.

A listing of press releases together with copies of press cuttings is given in Appendix?

This being the first flood event to be encountered by the NRA(TR) makes it an appropriate time to examine the interface between the Public Relations Section and other Units.

Whilst it is emphasised that co-operation between staff from all Sections was extremely high, and that throughout the duration of the flood event moral and motivation did not dwindle, it is perhaps prudent to examine ways in which the flow of information to the media could be streamlined.

In this connection points brought out in discussion with the Public Relations Manager include:-

- 1) PR were not informed until the morning of Saturday 3rd February by which time the situation was becoming critical. Would it be possible to be advised of a potential problem before the event gathered momentum?
- 2) It appears that there is no set procedure to inform PR of the issue of flood warnings (Amber, Red).
- 3) The setting up of the press office on the 9th floor NH was crucial to maintaining control of the flow of information to the media. However, the availability of typing facilities and a fax machine would have been beneficial.
- 4) The issue of regular statements to PR detailing the development of the flood and the expected short term trends would have been helpful.
- 5) It would be beneficial to develop improved communications with staff at the Thames Barrier (PR were not aware that the barrier was closed on Monday 12th February).
- 6) There are no PR personnel based in Waltham Cross. How would the demands of the media be met if there was a serious flood event on the River Lea?

PUBLIC RELATIONS

MEDIA CONTACT - TELEVISION and RADIO

TV Interviews arranged:-

TVS	Coast to Coast	5.2.90	Filming in flood room Interview with George Merrick
TVS	Coast to Coast	7.5.90	Filming in Maidenhead & live interview with Les Jones at Purley
TVS	Coast to Coast	8.2.90	Filming in Maidenhead & interview with Colin Martin at Maidenhead Project Office
BBC	Breakfast Time	8.2.90	Interview with Jean Harper
BBC	Breakfast Time	9.2.90	Interview with Giles Phillips
Central TV		7.2.90	Interview with Peter Borrows in flood room
ITV	TV-AM	7.2.90	Interview with Les Jones in flood room
Central TV		8.2.90	Interview with Les Jones in flood room
BBC	Newsroom South East	8.2.90	Les Jones in flood room Filming at Maidenhead Peter Borrows interview down-the-line
ITV	Thames News	8.2.90	Interview with Les Jones at Maidenhead
ITV	TV-AM	8.2.90	Filming in Maidenhead

Radio Interviews

Several (often daily) interviews given to:

Radio 4
Independent Radio News
Radio 210 (Reading)
Radio Oxford
County Sound Radio (Guildford)
Capital Radio (London)
LBC Radio
Fox FM (Oxford)
GLR

(5) SUMMARY OF ACTIONS TAKEN DURING DUTY PERIOD

The attached sheet gives an indication of those sent out specifically to take video and photographic records and to acquire water level and extent of flooding information during my period of duty.

The purpose of this was three fold:

- (1) to get level information for the Flood Room to assist in tracking peaks and getting first hand information to enable Flood Warning judgements to be made e.g. Chertsey Bourne.
- (2) to get synchronised aerial and ground coverage of the tributaries for levels of Service proposes. Extent of flooding and water level information to enable calibration of levels of service reaches.
- (3) to attain basic data photographs, levels, extent of flooding on sites of specific interest to "Projects" or other groups i.e. Technical Support where Capital Works are ongoing or proposed e.g. Lower Colne; Maidenhead Windsor Eton; Aylesbury; R.Blackwater; Mapledurham Purley; Oxford, Datchet Wraysbury Staines, River Pinn.
- also for sites of specific interest to Technical Planning e.g. development sites, appeal sites, Catchment Planning interests.

T.S. FLOOD MONITORING: CALL OUT

DATE	TIME	NAME	COVERAGE
2/2/90	1000-1400	A W Higgs/	R. Blackwater
3/2/90	1100-1700	K Broadhead	
		P Johnson/	Aylesbury Bear Brook
		S Capel-Davies	
3/2/90	1200-1500	S Taylor	Lower River Colne
3/2/90	1400-	J Levy/Vama	R. Pinn
3/2/90	1500-2000	D Mills	River Loddon
4/2/90	1115-1615	R Keatley	Helicopter R Wey & Tribs;
			R Loddon; R Blackwater &
			Tribes
			R Thames; R Kennet
4/2/90	1200-1330	C Croucher	R Wey Woking - D/S Guildford
"	1100-1300	A Meadley	R Wey Confluence D/S
			Guildford
"	1100-1500	S Taylor	R Wey U/S Guildford
			Cranleigh Waters, N&S Arms
			of Wey
"	1000-1700	K Lead	R Loddon
"	1000-1700	M Townsend	R Loddon; Fulham Brook
"	1000-1700	K Broadhead	R Blackwater R Hart
"	1000-1400	S Capel-Davies	Aylesbury - R Thame
"	1000-1700	R Powling	R Ock; R Kennet; R Lambourn
"	1000-1700	A Higgs	R Blackwater
"	0900-1700	R Hulse	Maidenhead
"	1500-1700	T Lambourne	R Kennet Theale-Newbury
5/2/90	0930-1500	H Long	Chertsey Bourne
"		R Keatley	
"	0930-1730	M Townsend	Purley - Oxford
"		Sothi	
"	1100-1500	Julie Lee}	Oxford
		Joseph }	
6/2/90	0900-1100	P Kench }	Lower Colne
"	0900-	A Brookes }	Datchet Wraysbury
		H Long }	Staines Chertsey
		R Keatley }	
		M Townsend}	

(6) LOG OF FLOOD 2nd FEBRUARY 1990 - 13th FEBRUARY 1990
OFFICERS D G INNES and T J WEBB

2.2.90 0830 Control Room

R. Cherwell 0815 0.69m gauge "peak" 100mm higher than Christmas event.
Feb 79 event 1.46m on gauge.
Spoke to KJL and agreed no need to send anyone out.
Spoke to CEC re. Levels of Service. Neil Watson to investigate.

R. Wey

21mm overnight at Bowdon
18mm " " Cranleigh
0830 Tilford 1.554 and rising
0830 Guildford 30.696 SC-D has peak values for yesterday.

Rainfall at top end could cause problems later but could be 12-15hrs before peak reaches Tilford and other 12-15 hours to Guildford.

R. Blackwater

Spoke to AWH - Sheepbridge 0.89m probably not dramatic but AWH to consider going out for photographing sites affected by scheme proposals.
(AWH and K Broadhead)

1300 Helicopter from Booker going up with NSB/NW/MR to cover R.Ray, R.Thame and tribs. 2 hour flight.
Requested coverage of Aylesbury on SC-D behalf from Bear Bk confluence to u/s of town.

1500 R. Wey Contacted Dennis B. - Cranleigh waters appears to be dropping Flash Bridge dropping
Bramley steady

Tilford about at its peak 1.616
but Farnham higher than Dec 79 when we had trouble.
Millmead now at 30.690 so has remained high.
- could be a problem when Cranleigh Waters and upper Wey peaks hit.
But 15 hours Tilford - Guildford therefore maybe peaks will not coincide.

Issues of Red at Guildford will be held probably until late this evening.

1500 R. Blackwater

AWH reported that there was little of note. Would report to Dennis. In 4 hours of visit levels had dropped 80mm.

1530

CEC rang re. R. Wey.

RDP has left it to Steve Magenis to assess if a helicopter is required tomorrow on the R. Wey.

R. Cherwell

Bob Warne and Mike Rowe to fly the length tomorrow.

1600 R. Thames

Robin Hulse rang requesting info. Boulsters Tail 13' @ 1441. He is interested should flows reach 280/290m³/5 i.e. about 14' 6/15' on Boulsters Tail. needs to get info. for d/s of Railway br on right bank.

3/2/90 0845

Contacted Dennis Boreham on the flood room - picture not cleat BUT no RED issued on R. Wey. Peak passed without problem at Guildford.

- radar picture showing heavy dollop over Aylesbury
- Thames levels will be done by 1030
- clarify picture then.

1040

Dennis Boreham - get people out.

1050

Jeff Kingswood - { R. Ock
@ Osney { Ray, Thame, Cherwell covered
{ inform flood room

1115

Jamal - baby sitting

1130

Steve Taylor - will cover R. Colne

1145

Jack Levy message left

1200

Doug Mills to cover R. Loddon later today

1205

Sothi no reply

1330

Jack Levy R. Pinn

1350

Vama - Widespread flooding expected
emphasised R. Pinn - Graham Cowell to be
informed for Projects interest.
- Vama to coordinate monitoring of River Pinn.

1800

Flood Room Mel

Amber on Loddon	Kennet rising
Wey	Ray "
Mole	Thame "
Colne	Staines - Poyle
Colne Brook	Copper Mill Rd
Pinn overtopped	
Maidenhead	RED

Info wanted on Lower Colne Brook - Mel to speak to Steve Magenis.

1810 DGI/Steve Magenis 0932 765388
 - has someone out at Lower Colne Bk - sandbags supplied
 - may want some relief for his gangs on Lower Colne
 - offered T.S. assistance but requested early relief as T.S. guys don't know the area. Not keen to send them out after dark
 - Wraysbury slot blocked.

1820 DGI/Robin Hulse
 - had already been informed by Mel all organised for tomorrow with Andy Pepper & others.
 - Lower Colne suggested Bob Keatley knows area well
 - also may need to look to see how well scheme working tomorrow visits? SC-D.

1830 DGI/Phil Johnson
 - informed him of position will keep in touch

1835 DGI/Doug Mills - still out.

2015 DNM rang Loddon interesting up @ Basingstoke Bramley could be higher than 74.
 discussed aerial photos etc.

3/2/90 2030 RDP discussion re. aerial photographs - Ops guys too busy. Need extent of flooding and levels suggestion discussed - Cherwell & Aylesbury & bolton of Thame. Wey & Loddon.
 Need to relate video to clock and mark time on map. Also need to hire copter and video camera man on R. Wey/Loddon.
 (need information where it is wet AND where it isn't)

2040 Mel Reds on Thame; Chalgrove; Ock; Chertsey Bourne - Egham - Weybridge
 Giles Phillips wants assistance from Tech. Services - suggests vodaphones

2130 Let into Nugent House by new doorman Les Jones!
 Jean Harper intending to get Police to put out alerts carefully to prevent panic - trying to stop media getting involved.

2215 John Wills - Aerial Camera System
 2215 Doug Mills reported to Dennis on Loddon
 2220 Bob Keatley - Helicopter yes
 Martin Townsend has video may need to cover Pangbourne Mayford Br. Woking.
 RK to organise Martin.
 Graham Croucher O.K. for helicopter

2235 RDP - NSB/RW/Mike Roe to cover western end of catchment Cherwell Evenlode Ock 2hr flight to cover as much as possible of tribs.
 - need to emphasise need for tribs info. required fly downstream in one and then come up following tribs as far as poss.
 - Problem with Heathrow

2300 tried Aerial Camera System.

2350 Left Flood Room for home.

4/2/90 0720 Malcolm Kelly - Sunbury Control Room
- very quiet. R. Wey

0725 David Van Beeston - suggests Lower Early & R. Hart

0730 Alan Mann Jennifer Worstfold
- helicopter for 1100

0740 Aerial Camera Systems camera mounting and cameraman
£1450 approx.
Nigel Bray - helicopter flight 0930 for 2hrs to cover
R. Cherwell, R. Evenlode, R. Ock.
Graham Croucher/Bob Keatley

0840 Keith Lead - Loddon

0845 Tony Higgs 1230 onwards

0915 Kevin Broadhead Blackwater Hart

0930 Adrian Meadley - u/s from confluence to Guildford

0920 Steve Taylor u/s of Guildford - lunch at folks
Cranleigh Waters.
Barry Winter - Worcester

0945 Mike Mombrun - out

0950 Nick Smith - out

0955 SC-D - Aylesbury then R. Thame

1005 Update

1010 Flood Room

1015 RDP - will cover - Ock, Kennet, Lambourne

1025 CEC -

1045 Jean Harper - message from Tony Higgs - Blackwater
worth a look

1145 Flood Room let in by Peter Borrows

1150 Steve Magenis problem at Wraysbury Mill Paper Mill
Weir structural problems cracking. Hythe End Rd 30mm
up on last night still rising

1200 Tried Paul Martin - no luck

1210 Graham Croucher - only Bob on helicopter 2hrs of
fuel
- 1120 flight. Too much kit with cameraman

- GC to go for area Guildford to Woking then go back
to meet Bob.

Loddon peaked 6am peak in Thames 2100?

1215 AWH - req. update following 2 levels rung in the
morning 10am Arborfield peak

1230 RH - Maidenhead Officer 0628 777533
- to investigate Mrs Shepherd, 2A Lower Cookham Rd
0628 26593
RH will contact Steve Magenis or Melv Flood Dep.
0753 853517
0753 850770

1245 CEC - R. Kennet possibility for chopper trip next
 - CEC to take maps to GJC/RK at Cobham
 - may then cover lower end of Thame if time right

RH - Ultra Sonic figures required every 2hrs
 3/2/90 0705 292m3/5
 1350 291m3/5

1310 1st Sortie finished . R. Wey Cranleigh Waters
 Hoe Stream N & S arm of Wey
 - agreed he would cover Loddon, Blackwater then
 Kennet if possible - Maidenhead if poss. last
 - will leave message for Graham & Colin.

1320 Tried Adrian Meadley - no luck 0932 349981
 1325 Benson still rising
 1335 Martin Townsend - vodaphone informed him of complaint
 from Briars Close, Pangbourne.
 Martin will cover.

1345 Keith Lead

Loddon Br 38.42m @ 1345
 Twyford Mill 35.11 HEAD 1200
 34.90 TAIL

Ford - 8ft deep
 Sandford Mill - road impossible KJL heading for
 Sindlesham

Kevin Broadhead Blackwater & Hart done
 Eversley out of bank

PB/Mel. Water at Flowing Spring half way up car
 park.

1405 SC-D/Dennis/Thame steady Shabbington Br 8.30 60.34
 Now 60.38

Chulsehampton possibly falling

1420 Rang Jeff Kingswood Rdg 479575 for update on Kennet
 coverage
 - John Hillier covering u/s Newbury
 - Suggested Terry Lambourne Rdg 883738

1425 Terry Lambourne - requested levels and extent of
 flooding between Newbury and Theale O.K. will go
 and contact me of Jeff later.

1430 CEC at Chobham/Fairoaks - update
 - will call Steve, C-D for update/advice on
 R. Thame

1440 Robin Hulse - Mrs Shepherd dealt with
 - town down to Windsor no real problems

1445 Dave Rylands/DGI discussed gauging in and around
 Oxford and contact Pam Naden.
 - DR to speak to Tim Webb & John Gill

1450 Adrian Meadley - no luck.

1520 GJC R. Wey Guildford
Head Millmead 31.69 1315 Not much
problem
- inbanks
Mayford Br 4' 10" 1300
CEC has spoken to SC-D and is not going to go to
R. Thame.

1600 Adrian Meadley - info on Byfleet Mill 15.45 Head}1215
15.10 Tail}
Oil Mills 10.48 Tail}1030
Wey Navigation 11.1m }

AM will go out again to Byfleet Mill and Newark Mill
Peak at Guildford 1800 peak at d/s end 0600ish - get
Adrian out 1st light early tomorrow

1610 Bob Keatley - back at Fair Oaks
covered Loddon - Blackwater - Farnborough -
current of Cove Bk
Whitewater u/s
R. Hart u/s
Loddon u/s - limit
Kennet from Whitley Treatment wks -
nearly Hungerford
Reading - Henley on R. Thames
Stills of lower end of R. Loddon
- not VHS compatible but will sort out
- 40 knot winds causing problems for filming.

1700 Kevin Broadhead - O.K. back home debriefing
tomorrow.
KJL - back O.K. - will check MARTIN.

1705 John Wills - early debrief
1705 Went Home
1730 Steve Taylor checked in O.K.
1750 Martin Townsend checked in O.K. - going to office to
recharge video & vodaphone.

1845 GPGJ - update
1850 Adrain Meadley checked in O.K. - requested early
sortie (!) tomorrow morning. O.K.

5/2/90 0745 Checked with Sunbury - no real information
available.

Flood Room

0805 Guildford 31.5 1700 4/2/90
Old Windsor 300m3/s 0805 Thames.3" rise
overnight.
Chertsey Bourne information required by Dennis
Guildford Street Library Free Prac Rd. Drill Ham Rd
Eastworth Rd Paddock Way
Relative levels
John Gill requires assistance with gauging

0900 RGG no surveyors available to assist
0925 Hazel Long/Bob Keatley to view Chertsey Bourne
vodafone No 0836 715820
0925 John Gill requires assistance at Enslow to gauge
across the flood plain bypassing the weir.
0925 Martin Townsend out to Purley to video.
0940 CEC - no real action 0836 715819. Stu still thinks
Wey at problem.
0940 Ian Rose - guaging at Enslow, Weybridge, and Wheatley
on Thames to be done by John Gill and Co.
- no extra assistance required.

0945 Sothie - to contact Martin and visit Purley and
take him to Oxford if necessary. To keep in touch.

0955 Roger Pethick - queries re. Blackwater - speaking to
Kevin Broadhead and Tim Webb.

0955 Tim Webb - update & Sheepbridge GS will go out to
look at bypassing etc. - contact KB/RP.
- Kingston 450m³/5 therefore will run high for 4
days.

1030 CEC - update
- Wey park around Byfleet now
- thinking of vertical aerial photography
following dicussion with DNM/RGG/DGI requested
they coordinate through John Wills.

1035 DGI/Julie Lee - to contact Sothi/Martin with a view
to helping get information @ Oxford. Julie and
Joseph going out.

1040 Howard House - Adrian Meadley off sick.
1050 Sothi @ Purley wants Julie out to get info. at
Bullstake Stream Oxford
14 properties flooded at Purley? TVS on site.

Thoughts for sytem improvement Cacthment Map with
magnetic markers for location of T S Personnel.

1150 NSB - update on R. Thames
- Saturday successful Sortie!
- planning flight am tomorrow to fly the length
of the Thames
- wants contact with RK/Martin Townsend re. video
editing new equipment etc.

1230 Martin Townsend rang in from Mapledurham. Heading
for Oxford with Sothi.

1245ish Bob Keatley reported on Chertsey Bourne - Red warning
removed - RK/HL making their way back via
Maidenhead.

1410 Sothi - Oxford area pretty bad Sothi wants aerial
coverage particularly from spillage from Thames into
Hinksey Stream.
- DGI to speak to NSB.

1420 CEC - Neil Watson to coordinate all flood monitoring information
 - Lawrence Gould to be asked to help out for 2wks
 - all info. to be transferred to maps

1430 NSB - aerial cover of Oxford - done yesterday BUT will attempt to get more tomorrow

1430 RH - Rowing course proposed u/s Boveney NSB to attempt to cover it.

1600 John Wills

R. Loddon - rose 6" between 6am and 12

Houses flooding in Marlow
 " " at Marsh (Henley)

1615 Keith Lead - at Maidenhead

1630 Nigel Bray - has organised flight from Kidlington 10am tomorrow
 - may be room for Sothi

1635 Sothi/Martin Townsend - just finishing at Oxford
 - Sothie to go to Kidlington 0930 tomorrow and then ring in to let me know what has happened.

1650 GPGJ - update - possible need to cover Datchet - Staines
 Bob Keatley - shifting sand bags in Maidenhead! GPGJ requested he contact Maidenhead office to assist Robin & Co.

1700 Peter kench - R. Colne he will take a brief look en route in tommorrow.

Thoughts on improvements
 Telephone numbers pasted inside cover of manual
 Flood room separate rooms/shares Mel & Del
 Plotting - Tech Serv - Planning
 Press/Jean Harper
 display of tel No of local Authorities/computer lists
 VDU by each phone for levels/flows/tele Nos/addresses

6/2/90

Flood Room - update and print of Windsor flows 320m³/s 0805
 - flows approaching the peak in Maidenhead
 - Levels Iffley - steady
 Benson - dropping (Thame gone)
 Mapledurham - "
 Marsh - "
 Boulsters - steady? 15' TWL
 Bell - up 3" 6pm to 6am
 Molesey - dropping

0900 Andrew Brookes - to coordinate
 Hazel Long } out to Datchet, Wraysbury with
 Vodaphones
 Bob Keatley }
 Martin Townsend }
 All instructed to report to Tim Webb.

0930 Tim Webb/John Wills briefing/debriefing session.

Key to initials referred to in log:-

SC-D	S Capel-Davies
AWH	A W Higgs
NSB	N S Bray
NW	N Watson
MR	M Rowe
KJL	K J Lead
CEC	C E Candish
DB	D Boreham
RDP	R D Powling
Mel	M Slingo
DNM	D N Mills
T.S.	Technical Services
RK/Bob	R Keatley
Martin	M Townsend
GPGJ	G P G Johnson
RH	R Hulse
GJC	G J Croucher
PB	P Borrowes
AM	A Meadley
KB	K Broadhead

Date	Time	Name	Coverage
Tue 6th Feb	09.00	D Innes	Change of Standby - Discussions
"	"	A Brookes	Datchet and Wraysbury area
"	"	H Long	" "
"	"	M Townsend	" "
"	"	B Keatley	" "
"	09.30	P Kench	Lower Colne
"	09.55	D Rylands	Maidenhead Area
"	11.10	B Keatley	Friary Island
"	11.40	P Kench	Lower Coln - levels lower than on 3rd
"	11.50	A Sothiratnam	Helicopter - Eynsham to Sandford
"	12.10	B Keatley	At Church Island - going to Runnymede
"	12.30	A Brookes	Hythe End Weir
"	13.10	B Keatley	Church Island - going to Old Windsor
"	14.15	T Webb	Sutton Courtenay telemetry failed Summit House called out to mend.
"	14.30	A Lawton	Adjusted Weybridge & Royal Mills instrumentation
"	14.35	T Webb	Informed Control Room of above
"	14.55	J Wills	Maidenhead area
"	"	J Gardiner	Maidenhead area
"	15.00	T Webb	Telephoned Windsor & Maidenhead District Council - general talks
"	15.10	H Long	Bell Weir, preceeding to Hythe End
"	15.20	R Pethick	Back from Wallingford area
"	15.30	B Keatley	Penton Hook, on way to Shepperton
"	15.40	A Lawton	Teddington. Reset Tail recorder (was reading 200mm too high)
"	15.45	H Long	Hythe End Mill. H = 15.10, T = 7.80 Level still rising
Wed 7th Feb	07.45	B Keatley	Discussion on arranging flight for aerial photography
"	08.20	T Webb	Agreed to proceed with flight
"	08.50		No flight - adverse weather conditions and problems with Air Traffic Control
	General:-	No staff dispatched into field because levels not significantly different to those already monitored. Conditions stable.	
"	12.00	B Keatley	Tributary of Cove Brook to examine report of flooding.
"	13.45	B Keatley	No flooding at above site. Probably a hoax call?
"	15.00	B Keatley	Swallowfield - just within banks
"	15.35	D Rylands	Thames at Pangbourne
"	16.20	R Pethick	Lower Loddon
Thurs 8th Feb	07.15	General:-	Tributaries rising but not as high as earlier in week. Thames steady with small rise expected later today.
Thurs 8th Feb	08.30	J Wills	Attempting to arrange aerial photography

Thurs 8th Feb	08.45	A Lawton	Measuring discharges Aylesbury area
"	09.05	T Webb	Helicopter flight arranged for 11.30.
			to cover Thames Maidenhead to Osney.
			Also Lower Loddon & Kennet to Newbury
"	10.30	S Taylor }	Recording levels on Lower Loddon to
		A Ingles }	tie in with aerial photography
		R Pethick }	
		P Odeosun }	Lower Kennet ditto above
"	13.30	J Wills }	
		S Appleton }	River Pang & Tidmarsh area
"	15.45	D Rylands	At Banbury
"	Late Eve.	G Phillips	Decision not to close Thames Barrier
"	Night	P Brady	Monitoring levels Thames Ditton and
			Throwlock Island during high tide.
Fri 9th Feb			Flood receding, no formal monitoring by Technical Services
			Personnel.
Tues 13th Feb			

(7) DISCHARGE AND LEVEL DATA

Within Catchment Control the Hydrological Services section operates and maintains a network of some seventy five flow measurement stations on the Thames and its tributaries. At each of these locations water levels are monitored and discharges calculated at fifteen minute intervals. These data are available for examination within the Hydrological Services Section located on the 6th Floor of Reading Bridge House.

A listing of these gauging stations are given in appendix

In addition to these seventy five permanent recording stations Hydrological Services also operate and maintain about thirty temporary water level recorders. Most of these recorders have been installed to provide data to assist Technical Services with the design of capital works.

A listing of these temporary gauging stations is given in appendix.

DISCHARGES MEASURED BY CATCHMENT CONTROL

Date	Time	Name	Coverage
Sat 3rd Feb	am	R Bailey N Everard	Discharge measurement of River Mole at Esher and Leatherhead.
Sat 3rd Feb	pm	J Gill	Inspections of the Cut and Bull Brook.
Sun 4th Feb	am	R Bailey I Rose N Everard	Discharge measurement of River Thames at Buscot.
Sun 4th Feb	pm	A Lawton A Waters	Discharge measurement of Ampney Brook and Wiltshire Ray. Inspection of Churn at Cerney Wick and Swill Brook at Oaksey.
Mon 5th Feb	am	A Lawton A Carpenter	River Thames at Wheatley measured.
Mon 5th Feb	am	J Gill	River Cherwell at Enslow gauged.
Mon 5th Feb	am	J Gill	River Evenlode at Cassington gauged.
Mon 5th Feb	am	I Rose	River Wey at Weybridge gauged.
Mon 5th Feb	am	T Webb	River Blackwater at Swallowfield inspected.
Tue 6th Feb	am	J Gill A Carpenter N Everard	River Thames at Sutton Courtenay gauged.
Wed 7th Feb	am	I Rose R Bailey N Everard	River Kennet at Newbury. Discharge measured.
Thurs 8th Feb	pm	J Gill	River Thames at Eynsham.
Thurs 8th Feb	pm	I Rose	River Wey at Tilford (overland flow measured).
Thurs 8th Feb	pm	A Carpenter	River Churn at Cirencester. Discharge measured.
Mon 12th Feb	pm	J Gill I Rose	River Thames at Reading Bridge. Discharge measured.

GAUGING STATIONS

REC#	NAME	RIVER/AQUIFER	GL	NGRE	NGRN
1	ABINGDON	OCK	SU	486	969
2	ALBURY	LAW BROOK	TQ	045	468
3	AMPNEY ST. PETER	AMPNEY BROOK	SU	076	013
4	BAGNOR	WINTERBOURNE	SU	453	694
5	BANBURY	CHERWELL	SP	458	411
6	BERRYGROVE	COLNE	TQ	1230	9820
7	BIBURY	COLN	SP	122	062
8	BINFIELD	THE CUT	SU	853	713
9	BRAMSHILL	HART	SU	755	598
10	BRIMPTON	ENBORNE	SU	568	648
11	BURY MILL	GADE	TQ	0530	0770
12	BUSCOT	THAMES	SU	230	981
13	CASSINGTON	EVENLODE	SP	448	099
14	CASTLE MILL	MOLE	TQ	180	502
15	CERNEY WICK	CHURN	SU	079	963
16	CIRENCESTER	CHURN	SP	020	028
17	CRANLEIGH WATERS	CRANLEIGH WS	SU	999	463
18	CRICKLADE	THAMES	SU	094	942
19	CROXLEY GREEN	GADE	TQ	0820	9520
20	DAYS WEIR	THAMES	SU	568	935
21	DENHAM	COLNE	TQ	0520	8640
22	ENSLOW	CHERWELL	SP	482	183
23	ESHER ULTRASONIC	MOLE	TQ	131	654
24	EWELL	HOGSMILL	TQ	2160	6330
25	EWELME	EWELME BROOK	SU	642	916
26	EWEN	THAMES	SU	007	973
27	EYNSHAM	THAMES	SP	446	087
28	FARNHAM	WEY(NORTH)	SU	838	462
29	GATWICK AIRPORT	MOLE	TQ	260	399
30	GATWICK LINK	GATWICK STR	TQ	285	417
31	GRENDON UNDERWOOD	RAY	SP	679	212
32	HAMPSTEAD NORREYS	PANG	SU	5310	7640
33	HANSTEADS	VER	TL	1510	0200
34	HEDSOR	WYE	SU	8960	8660
35	HORLEY	MOLE	TQ	271	434
36	HUNGERFORD	DUN	SU	321	685
37	INGLESHAM	COLE	SU	208	970
38	KINGSTON HOGSMILL	HOGSMILL	TQ	182	688
39	KINGSTON ULTRASONIC	THAMES	TQ	177	698
40	KINNERSLEY MANOR	MOLE	TQ	262	462
41	KNIGHTON	KENNET	SU	295	410
42	LEATHERHEAD	MOLE	TQ	162	564
43	LECHLADE	LEACH	SU	227	994
44	LETCOMBE BASSETT	LETCOMBE BK.	SU	375	854
45	LODGE FARM	WHITewater	SU	731	523
46	MARLBOROUGH	KENNET	SU	187	686
47	MISBOURNE LODGE	MISBOURNE	TQ	0470	8640
48	MISBOURNE SIDE	MISBOURNE	TQ	0470	8470
49	NEWBRIDGE	WINDRUSH	SP	402	019
50	OAKSEY	SWILL BROOK	ST	997	927
51	OLD FISHERY LANE	BULBOURNE	TL	0390	0620
52	PANGBOURNE	PANG	SU	634	766
53	POULTON FARM	OG	SU	194	697
54	RAMSBURY	ALDBOURNE	SU	288	717
55	RICKMANSWORTH	CHESS	TQ	0660	9470

GAUGING STATIONS

REC#	NAME	RIVER/AQUIFER	GL	NGRE	NGRN
56	ROYAL WINDSOR PARK U/SO	THAMES	SU	982	773
57	SHABBINGTON	THAME	SP	670	055
58	SHALFORD	TILLINGBOURN.	TQ	000	478
59	SHAW	LAMBOURN	SU	470	682
60	SHEEPBRIDGE	LODDON	SU	720	652
61	SHEEPPEN BRIDGE	AMPNEY BROOK	SU	105	950
62	SUTTON COURTENAY	THAMES	SU	516	946
63	SWALLOWFIELD	BLACKWATER	SU	731	648
64	SWAN HOTEL	BIBURY SPR	SP	113	069
65	TEDDINGTON	THAMES	TQ	170	714
66	THEALE	KENNET	SU	649	708
67	TILFORD	WEY	SU	874	434
68	TROUT FARM	BIBURY SPR	SU	113	069
69	TWO WATERS ROAD	BULBOURNE	TL	0550	0590
70	UXBRIDGE	PINN	TQ	061	827
71	WATER EATON	RAY(WILTS)	SU	121	935
72	WEYBRIDGE	WEY	TQ	068	641
73	WHEATLEY	THAME	SP	612	051
74	WHETSTONE BRIDGE	MARSTON M BR	SU	128	964
75	WORSHAM	WINDRUSH	SP	299	107

TEMPORARY GAUGING STATIONS

REC#	NAME	RIVER/AQUIFER	GL	NGRE	NGRN
1	CARTBRIDGE BAMPTON	HIGHMOOR BROOK	SP	311	035
2	BRIZE NORTON BASE	TRIB HIGHMOOR BR	SP	289	073
3	MOAT COTT BLACK BOURTON	SHILL BROOK	SP	264	041
4	PRIMROSE COTT BAMPTON	SHILL BROOK	SP	315	028
5	MILL FM. BAMPTON	SHILL BROOK	SP	294	041
6	LAUNTON	RAY	SP	616	218
7	ASTLEY BRIDGE FARM	RAY	SP	596	175
8	FENCOTT BRIDGE	RAY	SP	570	162
9	ODDINGTON 2	RAY	SP	552	142
10	ODDINGTON 1	RAY	SP	554	147
11	ISLIP	RAY	SP	529	188
12	ARABELLAS LAKE	LETCOMBE BK. LETC	SU	374	852
13	SPRING LAKE	LETCOMBE BK.	SU	383	859
14	WATERMEAD	THAME	SP	821	154
15	INDUSTRIAL ESTATE	BEAR BROOK	SP	8280	1390
16	18 CALIFORNIA	CALIF. BROOK	SP	8170	1340
17	BEARBROOK HOUSE	BEARBROOK	SU	810	137
18	178 PREBENDAL AVE.	SOUTH C'T BK	SP	8110	1300
19	HARWELL BRIDGE	STOKE BROOK	SP	8060	1290
20	AYLESBURY S.T.W	THAME	SP	789	148
21	WARFIELD	BULL BROOK	SU	883	711
22	WEIR SITE	BULL BROOK	SU	877	719
23	WARNE BRIDGE	THE CUT	SU	884	719
24	THREE LEGGED CROSS	THE CUT	SU	870	714
25	BINFIELD MANOR	THE CUT	SU	855	707
26	NORTH MIMMS	MIMMSHALL BR.	TL	231	037
27	COLNEY HEATH	COLNE	TL	198	059
28	ST. ALBANS	VER	TL	143	068
29	MEAD CULVERT	HARTSBOURNE	TQ	121	934
30	7 THE MEAD	HARTSBOURNE	TQ	121	933
31	OXHEY FLUME	TRIB. HARTSBOURN	TQ	117	938
32	OXHEY CULVERT	HARTSBOURNE	TQ	118	938
33	HAMPER MILL LANE	HARTSBOURNE	TQ	108	947
34	POYLE	COLNE	TQ	033	764

(8) LOG OF AERIAL PHOTOGRAPHY

By using a variety of techniques over the course of this event a great deal has been learnt concerning the most appropriate means of getting an aerial record of a flood event. The problems, constraints and recommendations will need to be specifically identified once a full analysis has been carried out on the data. For this report I have attached a log of the helicopter flights, fixed wing flight and a copy of the procedures established for obtaining clearance from Heathrow for future events. (Also some pointers to getting the best results intituled "The Art of Helicopter Flying").

FIXED WING FLIGHT

Flown at 3500 feet from Benson to Eynsham and including a short section of the downstream end of the River Cherwell on 12th February 1990.

Stereo pairs of photographs were taken vertically along the flight footpath at a scale of 1:7000.

Further information available from Dick Greenaway.

HELICOPTER SURVEYS

1. 2.2.90. SKYLINE HELICOPTERS LTD., (JET RANGER)
Wycombe Air Park, No rear door on pilots
Near Marlow. side.
Bucks. G-W177

1.5 hours. Total £725

Crew - N.S. Bray Navigator
N. Watson Stills Camera
M. Mombrun Video camera (Canon VC20 + VC30 Recorder from
Contracts Section)

Route

Booker airfield cross country to Islip (2.25 pm)
Up Ray to Three Points (beyond A41)
Cross country to Dorchester (2.54 pm)
Up Thame to Aylesbury (3.20 pm)
Back to Booker.

2. 4.2.90. CSE AVIATION LTD., (JET RANGER)
Kidlington Airport. G-BRMH
Oxford.

1.55 hours. Total £936

Crew - N.S. Bray Stills
R.G. Warne Navigating
M. Rowe Video camera (Canon VC20 + VC30 Recorder Contracts)

Route

Kidlington cross country to Boddington Reservoir, downstream Cherwell, tracking tribs. At Thames confluence, upstream to the R. Evenlode. Up the Evenlode to Ascot-under-Wychwood. Across to the Windrush at Burford. Downstream to Northmoor. Up Thames valley westwood taking in north Thames tribs. such as Shill Brook almost to Lechlade. Up the Cole to Coleshill. Across to Farringdon on the upper Ock. Down the Ock to Abingdon. Down the Thames to Dorchester. Up the Thame as far as the Chearsley Brook, up the Chearsley Brook. Across to the Upper R. RAY (Heath Bridge) and down the RAY to Kidlington.

3. 6.2.90

CSE AVIATION LTD
Kidlington Airport.
Oxford.

(JET RANGER)
No doors.

2.55 hours. Total £1,483

Crew - N.S. Bray Navigator/stills
M. Rowe Video Camera (CANON)

Floats and life raft required.

Route

Kidlington to Thames at Oxford, South Hinksey to King's Weir for Sooty. Then down to Marlow Bridge, downstream to Maidenhead (3 passes) and down to Teddington. Refuel at Chelsea. Up to Marlow bridge across country, then upstream to Shiplake/Sonning battery failure, stills coverage beyond Reading.

4. 8.2.90.

Alan Mann.
Fair Oaks.
Chobham.

Crew - R. Keatley Navigator/stills
N. Watson Stills
M. Rowe Video (Tech. Services + CANON)

4 hours.

Route

Cross country to Windsor U/S to Maidenhead/Cookham. U/S to the Loddon. Up the Loddon as far as Blackwater, a little way up the Whitewater and Hart, turn back to Loddon. Back to Reading up the Thames to Pangbourne, up the Pang. On up the Thames to Abingdon, up the Ock. Back to Thames up to Kidlington for fuel. Back down Thames to Reading. Up the Kennet as far as Newbury. Round to the Enbourne. Cross country to Chertsey, up and down the Bourne, down to Wey at Brooklands, back to Fair Oaks.

N. Watson

16.02.90.

The Art of Helicopter Flying

Preparations

1) MAPS

O.S. Sheets are no good, clipboard can be used with elastic bands, holding selected extracts. Plan routes as well as possible in advance, though this does not always fit in with wind direction or air traffic control.

2) Clothing.

Warm clothes are needed especially for those sitting in the back or leaning out filming. Windproof clothing for camera operators is essential (overalls or weatherproof trousers which tuck into boots), the wind whistles up trouser legs like nobody's business.

3) Choosing your chopper.

The Jet Ranger seems to be standard and available from most charter companies. The advantages of using it are:

- i) Takes three passengers, which allows video cameraman, navigator and stills cameraman. (Charter companies need to know the number of passengers for fuel allowances).
- ii) Video cameraman can sit behind the pilot and have the door off to get a good view of the river. It is then easy for him to direct the pilot.
- iii) It is possible to use the two video cameras one from each rear door.

DISADVANTAGES

Jet Rangers are £425. (excl VAT) per hour. A Schweitzer 2/3 seater is roughly half the price and can also be used without a side door. Filming through the perspex bubble is not possible with auto focus. Three can be a squash, but friendly.!

4) Flying Conditions

Clear days are obviously a bonus, do not fly too early or too late as low sun angles give reflections off water. Try to keep the sun behind you. Wind speeds affect the capacity to hover or hold a steady course, buffeting can make you feel sick.

5) Optimum height.

This varies with the requirement. For Levels of Service in rural catchments 500 - 600 ft above the ground surface seemed pretty good. Over the Thames we were obliged to fly around 350ft in the vicinity of Windsor and Heathrow flight paths, this combined with the fact that the pilot had to stay directly over the course of the river meant that only one bank could be covered otherwise. The shots are virtually straight down, they include the skid and floats most of the time.

Detail of gardens/property is quite easy to distinguish at this height. It is certainly worth stopping every now and then to rise to say 1,000ft where possible and pan upststream/downstream to give a different perspective. Some of these shots at oblique angles of minor tributaries have been very useful.

6) Best view

Our cameraman favoured the view from the left hand side of the craft with no door. This allowed him to pan with the camera held in his right hand. When filming from the right hand door behind the pilot he found it difficult to pan with a bulkhead behind his right shoulder. For those that wish to hang out of the left hand doorway a proper harness is recommended as the security of a simple lever clasp provides an extra dimension especially in a steep turn.

7) Flying the Thames near Heathrow.

The charter company may need up to 24 hours notice, but it is not impossible to fly the Thames right into London. The height will probably be restricted. For our recent flight the rear doors had to be removed on both sides and a life raft and skid floats were fitted. This cut down the number of passengers from 3 to 2.

8) Still cameraman must be familiar with the camera. Requests vary between print and slide finish so two cameras are recommended, 36 print to reduce changes, cold fingers and unusual conditions plus the speed of things happening are not conducive to holding onto cassettes at 1000ft with an open door.

THIS INFORMATION SHOULD BE INCLUDED IN THE TSFMS RED MANUAL

AERIAL PHOTOGRAPHS OF FLOODS
IN HEATHROW CONTROLLED AIRSPACE

1.0 TYPE OF PHOTOGRAPHY

1.1 Although low level oblique photography with hand held cameras and videos has a place in flood recording, a far quicker, more complete and more accurate record is achieved by vertical stereo photography.

1.2 Vertical stereo photography produces rectified photographs which can readily be used to provide an accurate, scaleable plot of flooded areas. This can be done either by using photogrammetric techniques or by producing orthophoto maps and photomontages. The photos are of sufficient quality to allow enlargement many times to enhance detail. Whenever possible colour photography should be used. This is more expensive (about x1.7) but yields much more information.

2.0 PROCEDURE

2.1 Regretably much of our area is covered by controlled air space. As a result of attempts during the February 1990 flood event to commission photographic sorties the following procedures will have to be followed if the area downstream of Reading is to be photographed.

2.2 The flood must be of such severity as to attract NRA HQ support for a photographic record.

2.3 The request must be routed via the Regional Manager to HQ who will have to obtain the support of the Minister of Agriculture for the project.

2.4 An aerial survey company must be put on standby at the earliest possible moment so that they can produce flight plans and prepare the sortie. Once approval is granted they will need about 24 hours notice before the flight.

2.5 The survey should ideally be flown at 10,000 scale. The aircraft will fly at 5000 feet for this scale and the photographs will cover a swathe of about 1 km on either side of the flight path. This scale provides an acceptable compromise between detail and rapid coverage and the photographs can be enlarged to 2500 scale when needed. An additional advantage of this type of survey is that photogrammetric plotting can be used to provide ground heights of threatened areas just outside the flooded areas.

3.0 POLITICAL IMPLICATIONS

3.1 It should be borne in mind that in order to fly between Teddington and Reading it might be necessary to close Heathrow for up to half an hour - although the aerial survey companies dispute this. They claim that such flights were permitted up until 1988 and that the air traffic control authorities are being obstructive. Any such closure will obviously attract a great deal of press and public comment and not all of it will be favourable!

Nevertheless - as appreciated in the entertainment world - there is no such thing as bad publicity

(9) PLANS FOR USE OF DATA

Following the event a number of debriefing sessions were held to coordinate the incoming data, plotting and indexing.

It was agreed that the Technical Services F.M.S. duty officers would coordinate all the T.S. data and initially hand all the information to Flood Defence.

Flood Defence will then:

- 1) Plot flood outlines at 1:25000 scale (for Levels of Service)
- 2) Location of ground and aerial photographs (used to aid plotting in 1) above) will be marked on a set of 1:10000 scale maps.

When the above has been completed Technical Services will be handed

- 1) all 1:25000 scale maps with flood outlines
- 2) all 1:10000 " " " photo locations
- 3) all photographs and level information gathered

Technical Services Technical Planning Section will then need to arrange for:

- 1) Use 1:25000 scale maps for Planning purposes and supply to Local Authorities as necessary

- 2) Use 1:10000 scale maps as base for referencing and indexing all photographs taken during the event as proposed on attached sheet.
(FLOOD PHOTOGRAPH INDEX)

- 3) Index to be under three headings:

- a) aerial photographs
- b) ground photographs of specific interest
- c) " " " general interest

(9.1) FLOOD PHOTOGRAPH INDEX

It is proposed to set up an index system for all flood photographs held by the Reading Planning Office.

Initially the new index system will only hold flooding information collected during the February 1990 event.

However, once set up the index can be used to include all previous flood records currently held in a number of locations within the Planning Section.

* Attached is an example of how flooding information for different events can be shown.

All photographs will be plotted on 1:10,000 scale maps. Colour coding will be used to distinguish between different floods i.e. blue for 1947 red for 1974 etc.

Where ground photographs have been taken the 1 km square will be highlighted and the location of where the photographs were taken will be shown using a dot.

A set of 1:10,000 maps should be obtained from Dick Greenaway.

R Keatley
14th February 1990

(10) APPENDICIES OF DATA

1. FLOODING AT MAIDENHEAD - this will be the subject of a separate report to be produced by the Maidenhead Project Team at Maidenhead.
2. River Blackwater -
3. River Loddon -
4. River Wey -
5. River Colne -
6. River Thame -
7. Bear Brook -
8. River Thames Mapledurham/Purley/Oxford/Datchet, Wraysbury
9. Chertsey Bourne -
10. Press and Television Releases.