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COMMUNICATING RISK: NEWS MEDIA REPORTAGE OF A
SIGNIFICANT NUCLEAR CONTAMINATION
INCIDENT IN THE UK

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1. INTRODUCTION

Mass media news reportage is infusing society as never before with images and information about the nuclear power industry, including reports of accidents, leaks, expansion plans, waste management problems, safety standards, protest actions and new technological advances. The directed interpretations of developments which they communicate to their various audiences constitute important potential sources of influence in shaping people's attitudes towards nuclear power in general, and risk-related aspects in particular [*1]. Mass media cannot teach their audiences, as individuals, ways of making sense of what is going on, but touch nerve ends of current interest, and occasionally deeper chords of public consciousness. As such they can be crucial in the genesis and reaffirmation of people's positions on particular issues, both leading and following 'public opinion' (Zucker 1978, Davis and Baran 1981), or even standing as an incarnation of the culture, expectations and values of their audiences (Silverstone 1981). The significant potential social and psychological influence of mass media news reportage, in conjunction with the importance of public opinion in the politics and evolution of nuclear power programmes, recently matters of growing public rejection (van der Pligt et al, 1984), has led to increasing interest in the activity of the mass media in reporting nuclear-related issues.

In this paper we analyse and evaluate the way the mass media reported a controversial discharge incident at British Nuclear Fuels' (BNF) spent

fuel reprocessing facility at Sellafield in Cumbria in November 1983. With the exception of the Windscale fire in 1957, this discharge has constituted the most serious radiation incident at any nuclear installation in the UK. It was significant both for its immediate local impact associated with contamination of beaches (deemed by the government to be sufficiently serious to advise people to avoid their 'unnecessary' use for nine months), and for its wider national ramifications, occurring at a time of a growing crisis of confidence in the nuclear industry. It was also a time of heightened controversy over Sellafield in the wake of a prominent television documentary [*2] disclosing an increased incidence in leukaemia among children in its vicinity, radioactivity from Sellafield being the alleged cause of the increase. These observations underline the significance of the November 1983 incident at Sellafield as a case study for the purposes of the present paper. Still further significance derives from the position of the news media as the key channel through which government advice about avoiding use of beaches was transmitted to the public at large - no official notices were posted; no circulars were distributed in the area. It is, as such, also a case study in the transmission of incident management information (Scanlon 1978, Earle et.al 1981, Cunningham 1986)

Our aim is to use the November 1983 Sellafield incident to develop a more complete understanding of the way information about risk is communicated through the news media. We would like, in particular, to assess the following two issues:

(1) Accuracy: distortions from 'truth' in the accounts of events, and in the ostensibly 'factual', 'technical' or 'scientific' aspects of risk which are portrayed through the news media.

(2) Risk evaluation: overtly value laden elements of reportage about risk, including sentiments of alarm, danger and hazard, or

reassurance, calm and containment, and other portrayals of 'right' and 'wrong'.

These two aspects mirror the classic philosophical distinction between 'truth' (epistemological issues) and 'good' (moral issues). A similar fact/value distinction is already followed in much risk literature in terms of separation of risk estimation from risk evaluation (Kates 1978):

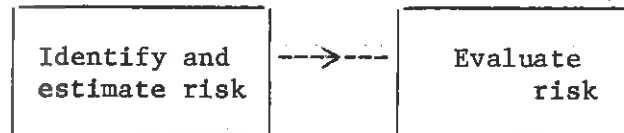


Figure 1: Classic stages of risk estimation and evaluation

As in the philosophical and risk literature, it will below be neither possible, nor desirable, to make the separation complete: there are intrinsic overlaps. We merely use the distinction to provide a loose structure for our analysis.

Analysis of the two issues of 'accuracy' and 'risk evaluation' will allow us to reflect on the different signals about perceived, potential or actual risk that news media made available to their various audiences in the chosen empirical context. This analysis will inevitably fall short of a full understanding of the symbiotic relationship between the news media and their audiences (Lemert 1981, Davis and Baran 1981, Lowry and DeFleur 1983), and of the influence of news reportage on formation of people's attitudes to nuclear power in general, or Sellafield in particular (Mazur and Conant 1978, Mazur 1981, Wober and Gunter 1984, Poharyles 1987). This must remain a crucial matter for large scale future research. However, this paper can contribute to a partial understanding of this more complex set of issues through its systematic analysis of what the news media portray. The paper can also make timely contribution to growing intellectual interest in 'risk communication' (ESRC 1987, Society for Risk

Analysis 1987), and in the role of the media in shaping the public's (poverty of) understanding of scientific issues (Royal Society 1986, ESRC 1986). The paper will, inter alia, contribute insights into long standing debate about media balance (Lowe and Morrison 1984) and the 'fairness' of news media reportage in its coverage of nuclear power in general (Stephens and Edison 1982, The Media Institute 1979, Spears et al 1985, Donn 1982), and Sellafield in particular (Walker 1984, Macgill 1987, Wilkinson 1987) [*3].

2. THE EMPIRICAL BASE

A particularly wide range of news reports forms the empirical base of this paper: all the national newspapers (at the time), selected local press, national TV and local TV and radio [*4]. The breadth of news sources enables the full complexion of reportage to be assessed, as well as comparative insights to be gained into the differing content of different media (press, televisual, radio) and of individual reports (individual newspapers or news bulletins). This cross sectional analysis contrasts with other studies of environmental reporting in the UK in which a more piecemeal sampling or longitudinal approach precludes examination of the full diversity of news media outlets.

As a foundation for subsequent consideration of the issues of accuracy and risk evaluation, the overall complexion of reportage will be reviewed. In particular, the variety in headline treatment will be considered: the initial indications of the important features and deemed significance of news stories as depicted by individual reports. This will be complemented by a point by point analysis of the content of reports, adapting the method used by McQuail (1970), laying bare the comparative information

content of different reports in an open and explicit manner. We also take stock of the sources which the media themselves use for their information.

The tendency of mass media reportage to be characterised by a variable blend of truth, bias and muddle is widely recognised in general terms. The complexion of reportage will depend not only the medias' own historic prejudices and sales targets (searching for what in their own terms are 'good stories'), and production constraints (Golding and Elliot 1979, Mander 1980) but also the confused information they themselves are confronted with as source material for their reports (Cunningham 1986).

3. TWO ANALYTICAL ASPECTS

3.1 ACCURACY

To what extent do the news media give a 'truthful' picture of the subjects and events they report? In general, the literature leads us to expect to find media as creators, and not merely as reporters, of the realities which they project as news (Hall 1978). As to the more particular issue of media transmission of 'factual' or 'scientific' information, of which many aspects of nuclear risk information could be seen as particular cases, existing studies have found reportage to be often inaccurate, conflicting and confusing, with whatever 'true' substance there is tending to be accessible to the informed, not the uninformed; a reflection of inadequate and ineffective science writing techniques (Friedman et al 1986, Dunwoody 1982, Chronholm and Sandell 1981, Jones and Meadows 1978, Earle and Cvetkovich 1985). It should not be surprising that nuclear risk information holds special problems for media presentation. There are technical uncertainties, disagreements amongst experts, and a lack of a definitive set of 'facts' about particular aspects of nuclear risk (Mazur 1973, Eisenbud 1987). The media - often inaccurate with the simplest of

information - is faced with a challenge of formidable proportion if seeking to convey information accurately and lucidly - and are hardly alone in any failure to master this challenge. With the November 1983 incident at Sellafield, as with many other confused or distant events, the media's already complex selection of subject matter was to be further complicated by conflicting and competing accounts of what actually happened.

Media writing about nuclear risk is, of course, shaped by the availability and use of language for describing radiation levels, levels of risk, and so on. There are many ambiguities herein, further limiting the degree of possible accuracy of news reports. For example, it is ambiguous to say that something is 'radioactive', because everything is radioactive to some degree or other. However when the word "radioactive" is used in everyday language it is often implied to mean "more radioactive than normal" or perhaps "radioactive to the extent of being harmful". Other words, such as "contamination" are correspondingly open to different interpretations. It is largely the intrusion of such aspects which brings inevitable overlap between issues of 'accuracy' and of 'risk evaluation'. The english language simply cannot be viewed as a neutral, transparent medium of expression.

3.2 RISK EVALUATIONS

Beyond elements which are ostensibly factual, technical or scientific in nature, media reporting about risk inevitably introduces aspects which are overtly evaluative in character - notions of what is morally right (safety), wrong (danger), good and bad - at times to the extent of blatant dramatisation and sensationalisation in the search for a good story, and to prevent audiences from 'switching off'.

Media readily create risk evaluations through their use of language (for example, headlines of "Atom scare", or of "No Danger") and through their selective choice or omission of differing information and comment as to the significance of radiation levels. Risk evaluations may relate specifically to physical risk levels (for example, implied acceptability or unacceptability of radiation levels on the beach), or to the deemed importance of events as a whole (major radiation scare, minor incident), or to the effectiveness and competence of risk management measures and risk management institutions (building or undermining credibility and trust in the responsible institutions, and whether, by implication, they are acting in the public (reader's) good. Since some of the risk evaluations projected through the mass media are those of involved participants, used by the media as information sources, the extent to which different agencies are used can be crucial. All in all, these considerations demand extension of the conception of 'risk' beyond that used in existing studies of media communication of risk information, where it is treated essentially as a technical or physical phenomenon (e.g. Earle and Cvetkovich 1985, Spears et al 1985). The broader conceptualisation of risk is also in keeping with the 'modern' social research view of risk as a social and institutional, not merely as a technical or physical, phenomenon (Otway and Thomas 1982, Douglas 1985, Wynne 1982).

4. THE EVENTS OF INTEREST

Many of the details of the November 1983 Sellafield discharge incident did not come to light until a related trial and prosecution of BNF in the criminal courts in June/July 1985. Even now some details remain unclear. At the time of the discharge there was considerable confusion as to what had occurred.

Reports prepared by the Nuclear Installations Inspectorate (NII) and the Department of Environment's (DOE) Radio Chemical Inspectorate, published in February 1984 constitute the most authoritative documented version of events (Health and Safety Executive 1984, Department of the Environment 1984; see table 1). In summary, there was a series of misunderstandings between shift managers in BNF's reprocessing facility at Sellafield, due to inadequate record keeping and communication procedures. This resulted in highly active crud, which would normally be separated out, being transferred into a sea tank. In order to deal with the 4,500 curies of radioactivity contained in this tank, an attempt was made to pump it back into the plant. However, because of the length of time this would take it was decided instead to release it into the sea. An estimated 600 curies of waste were emitted before radioactive levels on pipework rose to an unacceptable level and emissions were stopped. The remainder of the waste was transferred back into the plant. However, much of the additional radioactivity was apparently not held there but instead emitted out to sea over subsequent days as the transfer and sea pipelines were flushed out. Although the initial discharge took place on Friday November 11th, DOE were not informed about it until the 16th, at which stage the event was "not judged to be of great consequence" (DOE 1984, pg 24). This was because BNF had told DOE that only 600 curies of radiation had been discharged, whereas a greater level had in fact been emitted through a series of discharges between 11th and 16th November. The precise level of the total discharge is still unknown; the RChemI estimate is "a significant proportion" of 4,500 curies (Ibid, page 4).

The discharge became 'public knowledge' on 17th November when the Guardian newspaper reported Greenpeace's claimed discovery of a slick in the sea on Monday 14th November in an article headlined "Divers near

Table 1 A chronology of major events (source DOE 1985)

Sunday 30/10	: Annual shut down starts.
Thursday 10/11 plant	: Highly active crud transferred to effluent treatment (see tank 1)
Friday 11/11	: Gamma alarm sounds. Pumping stops. : Line prepared for return to storage plant from Sea Tank 1. Return started. : Return stopped; discharge to sea of 600 Ci. : Discharge stopped when activity rises.
Saturday 12/11	: Return of residue to storage plant. : High radiation in working area : Transfer stops (pump cavitates) and flushing of line to storage plant starts. : Radiation drops on return pipe but still high round sea tanks discharge.
Sunday 13/11	: Flushing to sea starts. High radiation noted. : Radiation falls. : Sea Tanks back in normal service.
Monday 14/11	: Oily radioactive slick observed by Greenpeace.
Wednesday 16/11	: DOE monitor beaches.
Thursday 17/11	: Sea Tanks are both run down to lower levels than usual.
Friday 18/11	: BNF report active oil slick at sea.
Saturday 19/11	: Wind changes - high activity found on beaches. : Access restricted as monitoring continues. : DOE notified 1200.
Sunday 20/11	: Public access resumed 1500.
Tuesday 22/11	: 2 high activity clumps of seaweed found. : DOE Inquiry starts.
Thursday 24/11	: Further high activity found in seaweed.
Tuesday 29/11	: First results of BNFL analysis of contaminated beach debris.
Monday 30/11	: DOE advise public not to use beach unnecessarily. : Samples sent to NRPB.
Friday 2/12	: Preliminary results from NRPB.

Windscale pipe 'contaminated'. BNF apparently did not expect any environmental effects from the discharge. However, some of their staff spotted a slick at sea on Friday 18th November, and subsequent beach monitoring found some contamination on a short stretch of beach, resulting in BNF restricting access to it (whilst they cleared up the contamination) from Saturday morning until 3.00 pm on Sunday 20th. This initial beach use restriction prompted the first substantial news coverage of the incident across the mass media. It constitutes what is referred to as Story A in later analysis. As a result of the beach access restrictions (often referred to simply as beach closure), William Waldegrave, the minister of state for the environment who was then responsible for radioactive waste management, was interviewed at length on Radio 4's "World at One" programme on Sunday. He stated, after repeated questioning, that BNF were not meeting the "highest standards" expected by the government. The radio programme built up a picture of mounting concern and pressure on BNF because of recent events and controversy.

During the subsequent week, monitoring of the beaches by BNF was extended and samples were analysed by the National Radiological Protection Board (NRPB), the official radiological advisory institution in the UK. However, after several follow up reports about inquiries into the incident, and a statement and brief debate in the Commons, the focus of news attention soon shifted to an attempt by the environmental protest group Greenpeace physically to block BNF's discharge pipeline, and BNF's legal attempts to stop them doing so. Greenpeace's actions received substantial coverage especially on TV and continued to raise the temperature of the controversy surrounding Sellafield.

Meanwhile, clumps of contaminated seaweed were found by BNF, and after analysis the DOE decided that they were contaminated sufficiently to issue

advice to the public over the use of the beaches. A press release on 30th November referring to monitoring over a 20 mile stretch of beach from St Bees Head to Eskmeals stated that:

"It might be wiser, for members of the public to avoid unnecessary use of the beaches (or swimming in the sea) on this stretch of coast for the time being"

The issuing of this advice constitutes Story B in the analysis below. It was covered by TV reports on the evening of November 30th and by radio and newspaper reports on December 1st. In interviews William Waldegrave stressed that 'openness with the public' was the motive for giving out this advice and the details of contamination found:

"These pieces of seaweed are more unpleasant than the things that came ashore before and I think it is important without going too far the other way...its a fine decision to make...as to whether you worry people more than is necessary. But I believe the only way really of giving people confidence about these matters is to be completely open about them".

(ITN News at Ten, 30/11/83)

In contrast, Greenpeace and local pressure group CORE (Cumbrians Opposed to a Radioactive Environment) argued that BNF had not been open with the public, that the incident would never have been revealed had they not accidentally found it, that such incidents had occurred before but had not been made public, and that action was only being taken on this occasion because of the level of publicity currently surrounding the plant.

Although the present paper concentrates on the initial formative reporting of the November 1983 discharge incident at Sellafield and its immediate consequences, the contamination and its wider implications became a news story for approaching two years, with reports of the gradual lessening of contamination, the eventual lifting of the official beach use advice (summer 1984), the successful criminal prosecution of the plant operators

(BNF) over the discharge (summer 1985), and the extensive and divisive debate that surrounded the sequence of events at a national and local level.

5. STORY A, 20th/21st NOVEMBER

5.1 OVERALL COMPLEXION OF REPORTAGE

News media coverage of BNF'S initial beach closure drew on a range of source materials: statements made by BNF about the contamination and the action they were taking to deal with it; Greenpeace's account of earlier events involving their dinghy (from which their divers were working in attempting to block Sellafield's sea discharge pipe), and earlier alleged leaks, 'inside' accounts by workers of operations at Sellafield; and a range of statements and comments made by the minister of state for the environment, William Waldegrave.

5.1.1 HEADLINES

News media headlines can be conveniently considered in three main groupings (table 2). The first group (A) do not feature the discharge incident itself but only the comments of William Waldegrave. What is significant for these reports was the juxtaposition of the contamination incident with critical comments from a government otherwise strongly supportive of the nuclear industry. The minister's comments are variously described as "fears" "worries", and as "ordering" of the tightening up of safety procedures.

The second group (B) concentrate on the beach contamination and closure. Their messages are highly divergent: the Daily Star declares that the "Atom Slick is not dangerous" and the BBC news (radio and TV)

Table 2 News Report Headlines: Story A

Source	Date	Headlines	Group
<u>National Newspapers</u>			
Times	21/11	"Government Sellafield Fears"	A
Guardian	21/11	"Government worried by washed up waste"	B
Telegraph	21/11	"Radioactivity closes beach at Windscale"	B
FT	21/11	"Government orders investigation of waste washed up on beach"	B
Mail	21/11	"Radioactive waste washed on beach"	B
Express	21/11	"Whitehall fears over atom waste"	A
Mirror	21/11	"New fear on A plant safety"	A
Star	21/11	"Atom slick no danger"	B
Sun	21/11	"Two contaminated on A plant leak"	C
M Star	21/11	"Cover up of nuke fuel dumping"	C
<u>Local Papers</u>			
Evening News + Star	21/11	"Alert over atom waste on beach"	B
Whitehaven News	24/11	"Radioactive slick contaminates Seascale beach starts inquiry" (Windscale under fire again.)	B
<u>Local Radio</u>			
Radio Cumbria	21/11	"Officials at British Nuclear Fuels have now reopened the beach that was contaminated with radioactive waste at the weekend"	B
<u>Television</u>			
ITV National	20/11 PM	"The Government has ordered the firm running the Sellafield nuclear reprocessing plant in Cumbria to tighten up their safety procedures"	A
BBC National	20/11 PM	"Scientists have been clearing away radioactive waste washed ashore in Cumbria"	B

correspondingly concentrates on the successful handling of the incident by "scientists" and "officials" with the clearing up and reopening of the beach. The local Evening News in contrast conveys a greater sense of urgency with its headline "Alert over atom waste" and other reports concentrate on the fact that the beach was closed, rather than on its reopening.

The third group of headlines (C) have contrasting individual interpretations. The Sun in an 'exclusive' article features a 'staff sources' account alleging the contamination of two workers inside the plant when the radioactivity was released. The Morning Star features the claims made by Greenpeace that past incidents had been "covered up" by BNF.

This diversity of headline treatment reflects the varied and conflicting accounts of events which were available, and the different evaluations of their significance and of associated risks. The content of the corresponding articles bears this out more fully.

5.1.2 CONTENT

A point by point analysis of the content of news reports (table 3) shows that they range from including as many as 60 points (the local Whitehaven News) to only 5 (the Daily Star). There are some (but not many) shared points of information included in the majority of all news sources (see foot of table). The following seven feature in 10 or more of the 15 news reports, the agreed 'core' of the story.

Point No	Point	No of reports
1	Radioactive slick washed inshore from pipeline	15
2	200 yards of beach closed off	13

Table 3 Content Tabulation: Story A

POINTS	T	G	U	Te	FT	Ma	Ex	Mi	St	Su	MS	R	IN	EN	WN	EN	TOTAL
<u>Incident</u>																	
1. Radioactive slick washed inshore from pipeline	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	15
2. Beach closed	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	13
3. Beach guarded by police/security men	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7
4. Contaminated debris removed	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	11
5. Beach reopened	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	11
6. Slick formed by solvent	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	10
7. Calm weather meant slick did not disperse	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7
8. Part of normal procedure during annual shutdown	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	5
9. Alarm bells rang in plant	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
10. Details of plant involved	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
11. Government ordered inquiry	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
<u>Greenpeace</u>																	
12. Slick discovered by Greenpeace	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7
13. Dinghy contaminated a week ago	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	5
14. Radiation level high	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	8
15. Claim of second incident	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
16. Boat being examined by NRPB	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
17. Called for immediate cessation of discharges	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	5
18. Allege no reporting if they weren't there	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
19. Allege have been unreported incidents before	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
20. P. Wilkinson: situation is getting out of control	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
21. Boat heading out again	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
<u>BNFL</u>																	
22. Figure for amount of radiation released	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	8
23. Deny any danger to the public	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	11
24. Deny men contaminated	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
25. Declined to comment on Waldegrave	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
26. We keep within government standards	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6
27. Claim between 2-5 times normal level of radiation	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
28. Deny Greenpeace role in reporting incident	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
29. Are monitoring beach	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
30. Would have preferred it not to happen	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
<u>Workers Account</u>																	
31. Claim discharge higher than announced	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
32. Log records 7,000 curies missing	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
33. 2 workers contaminated	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
<u>William Waldegrave Comment</u>																	
34. Government worried about safety at plant	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	13
35. Way radiation discharged does not meet high standards	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	11
36. Government worried for some years	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	8
37. Discharges cut but still room for improvement	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7
38. Government aims for zero additional measurable radiation	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
39. Contamination did not exceed safety limits	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
40. Other plants operate with lower discharge	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
41. Agreed that every addition to background radiation adds to cancer risks	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
42. New plant being introduced	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6
<u>Other</u>																	
43. Incident comes after YTV report	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6
44. Beach normally popular	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
45. Environment and Agricultural departments expressed concerns in past	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
<u>Total Shared Points</u>	17	19	26	23	14	8	9	5	7	13	29	17	15	25	19		
<u>Total Unique Points</u>	2	3	4	2	0	0	0	0	3	1	39	2	2	21	4		
<u>TOTAL POINTS</u>	19	22	30	25	14	8	9	5	10	14	68	19	17	46	23		

4	Contaminated Debris Removed	11
5	Beach Re-Opened	11
6	Slick formed by solvent	10
23	BNFL deny any danger to the public	11
34	Government worried about safety at the plant	14
35	The way radiation is discharged does not meet the governments high standards	11

The first five core points are generally presented as unattributed facts, or in some cases referred to as part of BNF's account. The relatively low number of points about the discharge which are not featured in common across all media reports reflects in part the brevity of the popular press articles, but also the extent of disagreement between source information used by the news media as to exactly what happened during the incident, how it was discovered and its consequences. The last three heavily featured points relate BNF minimising the danger to the public, and William Waldegrave criticising the plant [*5]. All in all, within the media's agreed core of the story, there is intrinsic conflict and ambiguity.

The large number of points that appear only sporadically can be broadly divided into several groups: those relating to the alternative accounts of the incident by BNF, Greenpeace and workers; those relating to various people's reactions to what occurred; different selections of William Waldegrave's comments; and detail and background to the plant and the continuing debate over its operation. The last include statements about the dangers from different types of radiation (Guardian), details of discharge limits (Evening News), details of sections of plant involved in the incident (local papers) and previous controversy surrounding the YTV documentary and the ensuing commissioning of Sir Douglas Black's Committee of Inquiry (Black Report 1984).

5.1.3 USE OF SOURCES AND ACCOUNTS

BNF and William Waldegrave are by far the most widely used sources of information, receiving almost the same level of attention, at around 70 points (table 4 - counting only those points which are directly attributed). Greenpeace and workers are used less: 52 and 23 points respectively. Although it would be easy to exaggerate the significance of such totals, they do indicate that the company and the government constitute the main sources of information and comment about the discharge incident. This is perhaps not surprising since they are also the main subjects of the story, and suggests that a "command post" perspective has been taken (Quarantelli 1978).

We must also recognise that information may not be being fully attributed. For example, the Mail explains how cleansing fluid is discharged down the pipe "where it forms a radioactive detergent slick normally broken up by the wind and tide", but continues "the sea was unusually calm and there was no wind. So the waste was washed ashore by the tide". None of this information is attributed in any way in the Mail, though the Financial Times and Guardian, for example, describe these 'facts' as the company's version of events (though conflicting 'facts' are put forward by plant workers and by Greenpeace). William Waldegrave and Jack Cunningham (MP for the parliamentary constituency in which Sellafield is located) seem largely to repeat information given to them by BNF. This gives further prominence to BNF's account.

Comments by Greenpeace are excluded completely from three news reports - the Mail, the Star and the Sun. They are given most prominence by the local radio, and by the Morning Star - the only national newspaper to

Table 4 Number of Attributed Points Per Source

	T	Gu	Te	FT	Ma	Ex	Mi	St	Su	MS	R	IN	BN	WN	EN	TOTAL
BNFL	4	5	8	8	2	-	2	1	4	3	15	3	7	8	4	74
G/Peace	4	5	5	4		1	1	-		4	18	3	2	4	1	52
Workers		3							4					9	7	23
Waldegrave	6	3	7	5	1	2	2	1	1	5	15	7	2	5	6	68
Others			1	2							10			6		19

feature Greenpeace's account more prominently than that of BNFL. Other reports selectively use aspects of use of Greenpeace's account and, in combination with the description of the groups comments in most sources as "claims" and "allegations", display a certain wariness by the media about the use of what is said by the group.

Workers' 'alternative' accounts of the incident are mentioned in only 4 reports. (It is perhaps worth pointing out that, with hindsight, these can now be seen to be the most accurate.) They are the main news angle for the Sun's 'exclusive' article and dominate the report of the local Evening News. The Guardian is the only other national paper to include any such points, and neither of the TV news reports includes workers' comment. This may be due to their earlier transmission on the Sunday, as opposed to the papers published on the Monday. Significantly, radio did not include any of the opposing account of the workers in its broadcast on the Monday morning, notwithstanding its local base and long interview format.

Overall some reports use points attributed to the different participants accounts more even handedly than others. The Times, Guardian, Morning Star, Sun, ITV News and Whitehaven News achieve a fairly even balance between BNFL and other accounts in terms of attributed points, but in some cases the manner in which accounts are presented may override any appearance of even handedness in terms of point counting. The Sun under the banner headline of "two contaminated in A-plant leak" spends its first 4 paragraphs on the workers claims, with BNF's denials included only towards the end. Reports which are not so even handed in terms of attributed points are those of the Telegraph, Financial Times and BBC, all of which feature BNFL's comment more frequently than the others; and the Evening News and Star, which concentrates on workers points at the expense of others.

5.2 ACCURACY

We focus on news media coverage of five ostensibly 'factual' elements: (1) the circumstances of the discharge (2) the nature of the discharge (3) the level of radioactivity released (4) the length and location of beaches affected by contamination (5) beach use restrictions.

(1) The circumstances of the discharge.

There is much disagreement across the media as to what occurred, as to who or what was responsible, and as to whether the discharge was a normal event or a mistake. In interviews on radio, BNF representatives stressed the combination of "unusual conditions" (tide and weather) and their inability to predict weather conditions, thus assigning ensuing beach contamination to a lack of dispersal rather than an unexpectedly high discharge (although they presumably must have known that one had occurred). This version of events is also reported by the Telegraph, Mail and ITV News, inter alia, playing down BNF responsibility for contamination (intrinsic overlap with risk evaluation here).

Other reports, in contrast refer to the presence of solvent as an "unusual circumstance" (Financial Times); it would normally be "separated out" (Guardian); or to mistakes within the plant (e.g. The Sun's references to a "massive bungle"). In these reports the discharge is not a normal event (with the implication that BNF is responsible for the ensuing beach contamination). Significantly, no news reports suggest that further contamination could be expected - most refer to BNF's statements that the debris had been removed (11 reports), contamination levels had returned to normal, and the beach re-opened (11 reports). Some (4) mention that monitoring is continuing, but not in a sense which implies a continued

risk of any sort. BNF's comment that the incident has been dealt with and is now over are not contended at all, although the workers accounts in the Evening News and the Guardian imply that a higher than admitted level of contamination might also be expected (or, indeed, subsequently happened).

(2) The nature of the discharge

The only substantive reference to the specific content of the discharge is found in the (10) reports which note the presence of solvent, with some naming this as "Purex". The Whitehaven News adds (possibly because of its later publication) that the solvent contained "thousands of curies of ruthenium", whilst the Guardian discusses the various types of radioactivity it could contain and their relative dangers. On Radio Irene Brunskill of the Barrow Action Group (subsequently to become CORE) alleges that the slick had "a large gamma reading" and contained "elements like plutonium which are extremely dangerous to human beings".

(3) The Level of Radioactivity Released

On this issue there is a picture of considerable conflict and confusion, reflecting the different information about the amount of radioactivity released with the discharge of solvent provided to the media by different sources.

Reports vary in the specificity with which radiation levels are described and in the source(s) they draw on for this information (table 5). Four reports (Times, Mail, Express and Morning Star) give no specific quantitative indication of radiation levels of the discharge at all. Most other sources present at least two alternative figures or descriptions of the discharge level, although the Star gives only BNF's "no danger" description (in line with its headline treatment) and the Telegraph and

Table 5 Use of Quantitative and Qualitative Terms for the level of radioactivity released: Story A

N = quantitative term
L = qualitative term

	T	Gu	Te	FT	Ma	Ex	Mi	St	Su	MS	R	IN	BN	WN	EN	TOTAL
BNF		N		N				L	N		L	L	L	N	N	9
Greenpeace		L	N	L		N						L	N	N	L	8
Worker		N							N					N	N	4
Other											L					1

Mirror give only Greenpeace's discharge figure (although including BNF comments about the level of danger on the beaches, see section 5.3). In relation to the use of quantitative and qualitative descriptors (see table 5), it is difficult to identify any obvious patterns, for instance between quality and popular papers or between TV, press and radio. Quantitative terms may at first sight seem more accurate, authoritative and scientific, but unless they are derived from complete and exhaustive measurement and readers understand their nature and can interpret them competently, then they are no more than mere schimera of scientificity.

Where specific figures are given (table 6) it can be seen that they are generally agreed for each participant - 500 curies for BNF, 7,000 curies for workers (these figures both relating to releases down the pipe and/or in the plant), and 200 times some given yardstick for Greenpeace (this relating to measurements made at sea). These ostensibly 'factual' descriptions are, however, related to a great variety of reference levels or limits, encouraging different interpretations by the reader, and vitiating any possible separation of factual from evaluative content.

The BNF figure is variously related to the "daily emission rate", "legal limit", "normal authorisation", "usual" discharge, and whether or not it was "dangerous". The Greenpeace figure is related to the "limit" of the Geiger counter, "normal background levels", "normal radiation at sea", "usual background level", "maximum reading on the dial". The workers' figure is related to the "permitted daily limit" and "normal doses" and is evaluated as "massive" and "soaring" (see table 6 for individual report quotations). This multitude of reference levels makes comparisons very difficult and indicates considerable ambiguity in the writing of the reports. It also reflects a basic language problem confronting 'factual' descriptions of levels of radiation: there are many reference measures,

Table 6 References to the level of radioactivity released

BNFL	GREENPEACE	WORKER	OTHER
"500 curies of beta radioactivity - just over twice the permitted daily emission rate" - Gu	"geiger counter reading went off the limits" - Gu	"20 times the permitted daily limit was discharged" - Sun	"a small amount of detergent went down the sea outfall ...
"only 2½ times the legal limit" - Sun	"200 times normal background levels of radiation" - Te	"a shift manager and a foreman absorbed high radiation levels" - Sun	no serious alpha radiation involved"
"500 curies of beta radioactivity - within normal authorisation from the regulatory authorities" - FT	"Abnormally high radio-activity" - FT	"a massive 7,000 curies of waste" - Ev News	- Jack Cunningham on Radio
"Radioactive content was higher than usual but still within limits" - BBC	"200 times normal radiation at sea" - Mi	"radiation dose levels soared" - Ev News	"has got near exceeding the limits of the amounts that are allowed down the sea outfall"- Jack Cunningham on Radio
"500 curies of beta activity well within the plants authorisation limit" - Wh News	"far higher than normal" - ITV Nat	"two men received abnormal doses of radiation" - Ev News	
"a quantity of solvent" - Radio	"up to 200 times the usual background level" - BBC		
"they insist the material wasn't dangerous" - ITV Nat	"geiger counter readings leapt from the normal 10 counts per second to more than 500 and went over the maximum reading on the dial" - Wh News	"the log also records that 7,000 curies were transferred" - Guardian	
"the company claim it was 500 and that 4,000 were stopped"- Ev News		"two men received abnormal doses of radiation" - Wh News	
"Windscale Experts denied there was any danger in the radioactive slick" - Star	"abnormally high levels of radiation" - Ev News	"7,000 curies vanished down the outfall" - Wh News	

and they may mean very little and appear incomparable to the uninformed. More familiar terms such as "dangerous", although seemingly more easily comprehended, are more overtly evaluative (value laden), and again open to very different interpretations.

The effect of using these various reference levels or limits is to make a given figure, such as BNFL's "500 curies", appear sometimes as an over-the-limit discharge (Guardian), and at other times as an under-the-limit discharge (Financial Times and Whitehaven News). It is difficult to surmise whether such varied interpretations are due to confusion, to carefully considered but divergent assessments, or to deliberate exaggeration or minimisation of the discharge's significance. Differing significance is also put upon Greenpeace's account, according to whether their measurement of radiation is described as the straightforward "200 times normal radiation" (Mirror) or the dramatic "geiger counter reading went off the limits" (Guardian). All these factors contribute further to the difficulty of separating 'factual' from 'evaluative' comment.

(4) Length and location of beach affected by contamination

The length and location of beach affected by the contamination might seem to be straightforward information for news reports to convey, but considerable disparity is again evident.

There is some disagreement between reports as to the length of beach affected: the Mail and Star refer to 500 yards, where most others have a figure of 200 yards. As to its location two reports refer to "Seascale beach", five to a beach near to Seascale, two to a beach near to the plant, whilst the remainder give no specific location. The two reports

referring to a beach near to the plant are the most accurate, as the stretch concerned was located away from the village of Seascale itself and near to the discharge pipe land fall. Those which relate the location of the beach to the village rather than to the plant increase its apparent proximity to population. This trend is continued and extended in the Story B reports (see more fully below) which refer back to the initial beach closure of Story A. Here The Times (1/12/83) are to state that "a beach in the village of Seascale was closed for 24 hours" whilst the Express are to extend the scale of closure by stating that two weeks ago "the village of Seascale was closed to the public for 24 hours". These retrospective accounts are highly inaccurate and illustrate the effect of time distancing in the journalistic recall of past events: considerable distortion of the significance of the initial beach closure to increase its physical proximity to local villages and, in the Express, to involve the closure of a whole village (summoning up images of road blocks and curfews).

(5) Beach use restrictions

Much disagreement across reports is again apparent. Neither the BBC news nor the Morning Star mentions that a beach had been closed (although the former says one was reopened). More significantly, reported responsibilities for closing down and guarding the beach are also at variance with each other. The Financial Times, ITV and BBC News simply refer to the beach being closed, the Guardian and Sun state that BNF closed the beach, the Daily Mirror, Telegraph and Radio reports refer to "security men" from BNF keeping people away from the beach, whilst the Whitehaven News refers to the "Atomic Energy Authority Police" cordoning off the beach. More ambiguously the Times states that the beach was "guarded by the police" whilst the Mail starts its article dramatically

with "Armed Police sealed off a beach yesterday". These latter two accounts suggest (without the knowledge that it was referring to the UKAEA police) the involvement of the civil police force rather than that of the nuclear industry, and in the Mail's case the more dramatic and authoritarian description of "armed police" - implying that the use of arms would be necessary to keep people off the beach. The image projected contrasts with Jake Kelly's (BNF publicity representative) description on the radio of "our own security men asking people to keep away" (here wrongly portraying UKAEA police as BNF staff). Visually on Television the scene is far from dramatic or threatening, with camera shots panning over a normal looking stretch of beach with a landrover parked on it, and a few men monitoring the beach or standing in a small group.

Although part of the 'factual' information available on the incident and the measures taken to handle it, the dramatic descriptions of the closure can also be seen to contribute to the media's overall evaluation of the significance of the November 1983 event and of the risk involved. If people have to be kept away with arms, then there is the implication that there is something exceedingly dangerous that they must be kept away from. In the next section we look more explicitly at news media's risk evaluations.

5.3 RISK EVALUATIONS

5.3.1 RISK EVALUATION THROUGH USE OF SOURCES

Here we are initially concerned with direct evaluations of the degree of risk presented by the beach contamination. The most widely reported evaluation, from BNF, is denial of any danger to the public. This is included in 11 of the news reports. Other BNF statements such as "a small amount of contaminated material was removed" and "contamination had not

exceeded safety limits" are also found in some reports. Other statements giving a deflated view of the level of risk are made by William Waldegrave (mainly on radio), often repeating BNF comment, and the NRPB (BBC News). Overall these are far more frequent than attributed statements referring to a serious level of risk (only coming from Greenpeace but in this latter respect other sources of evaluation become important). Moreover, status is conferred through the attribution of favoured sources of information not simply as BNF, but as 'scientists' and 'experts' from the plant; other sources are rarely described in such terms, with Greenpeace in particular often referred to with a marked wariness.

5.3.2 BALANCE OF RISK EVALUATION IN INDIVIDUAL REPORTS

Some reports can be seen positively to play down any sentiment of 'risk', whilst others highlight it, and some seem to adopt a more even position.

The most minimalist risk evaluation is that of the Daily Star which uses a headline of "Atom Slick - no danger" and carries only BNF's comments on the level of risk. The Financial Times also adopts a deflated view of 'risk', referring to 'low level' contamination, and again including only BNF's and William Waldegrave's comments. The Telegraph spends some time on Greenpeace's account and refers to their 'claim' of "200 times background levels" measured at sea but includes 4 of BNF's comments, including the comment that "you would have to spend several hours a day on the beach for two to three months before you approached exposure to a hazardous level of radioactivity".

In contrast the local Evening News and Star portray serious risk on the beach. With its headline of "Alert over atom waste on beach", sub-heading of "Contamination may have been heavier", and opening line of "radioactive waste which swamped the coastline" a clear impression of heavy

contamination and high risk is conveyed from the start. Given that the rest of the article is largely concerned with workers' claims over higher levels of radiation being discharged than admitted by BNF management, the significance of the risk involved is further stressed, although two BNF comments are included at the end of the report. The Daily Mail also tends to highlight a serious degree of risk, here through the use of colourful imagery rather than direct comment. Opening its article with the reference to "armed police" it continues: "Normally the 500 yards of sand and shingle is enjoyed by weekend walkers and young families. Yesterday the only people allowed on were scientists with geiger counters". An impression of ineptitude on the part of BNF is also given, because of their need to rely on the processes of nature: "They carried away any contaminated material and hoped the next high tide would wash the beach clean".

The Guardian and Sun both include only BNF attributed comments in the latter respect but imply a high risk through the link in both articles presented between the contamination and the workers claims over a high level discharge.

The TV reports and local radio present a range of evaluations of risk. The ITV news shows the competing claims of BNF and Greenpeace graphically on the screen as "no danger to the public" and "radioactivity higher than normal", respectively. Greenpeace is also quoted on the sound track as saying that "it's scandalous that Sellafield's operation can result in the closure of beaches and the contamination of the general public", a statement clearly emphasising the level of risk. In this report and that of BBC, however, Greenpeace's comments tend to be overwhelmed by the more deflated evaluations of BNF, William Waldegrave and the NRPB.

Local radio presents the competing viewpoints at most length with long interviews both with BNF representatives and with Irene Brunskill of the local protest group CORE. A significant BNF comment is made by Steve Jones, Environmental Protection Manager at Sellafield, who replies in response to the question "How dangerous is it down on the beach?":

"Well, I don't believe its dangerous on the beach at all. The sort of levels of radioactivity that we're observing are higher than we would normally expect to find at this time, that is, over the last four years. They are not very greatly different or higher from levels of activity that we might have expected to find, say ten years ago when our discharges were at a higher level."

(The various implications raised here about conditions ten years ago, and the change in standards that has occurred, are not pursued at all by the interviewer.) Irene Brunskill disputes the assurances of BNF, alleging that the content of the slick would be "extremely dangerous to humans" and stating in the interview that

"For BNFL to be saying there's no hazard and at the same time recommending that people stay away from the area possibly shows people just that there might be a problem with it".

The basis of her alternative evaluation of the risk is that:

".....any dose of radiation is bad for you, natural radiation is not beneficial to your health either".

This perspective is at the core of the differing views of radiation risk, but is not addressed in brief new items.

5.3.3 RISK EVALUATION THROUGH USE OF LANGUAGE

In terms of the nature and characteristics of the language used to evaluate the risk, the overwhelming majority are descriptive and general such as "no danger", "no significance" or "extremely dangerous". On occasions BNF comments relate to "safety limits" (without defining what these are) and in 3 reports a figure is put upon the level of

contamination (between "two and five times normal"). The problem of using relative terms is again apparent, and is recognised by Steve Jones of BNF who replies in response to questioning about how much higher than normal the level of radioactivity:

"Well that depends on the particular measurement you're looking at, but I would say in general between a factor of 2 and 5 higher than normal depending on which particular indicator you're looking at" (Radio Cumbria AM 21/11/83)

In his comments this factor is represented as justifying his assessment of an insignificant risk, whereas Irene Brunskill later remarks:

"If they say that its five times background then its still five times more than natural background radiation" (Ibid)

The closest any assessment comes to using some sort of indicator of comparative risk is the BNF comment, reported only in the Telegraph, about needing to spend several hours a day on the beach for two or three months before approaching exposure to a hazardous level of radioactivity. Although giving some impression of the sort of 'risk' that is being talked about, it is still not clear what a 'hazardous level' means: in particular, no reports suggest what sort of harm or actual effects exposure to the contamination could result in.

Overall it is clear that different selections and interpretations of available information are being made by the news sources, whether consciously or unconsciously. The net effect is that some give an inflated view of the level of risk on the beach, others understate it.

6. STORY B, 30th NOVEMBER / 1st DECEMBER

6.1 OVERALL COMPLEXION OF REPORTAGE

Analysis of a second 'story' provides richer empirical foundation for this paper, with further scope for assessing whether the same trends and patterns are repeated. Story B reports the next major 'happening' in

STATEMENT BY THE DEPARTMENT OF THE ENVIRONMENT

Monitoring of the beaches on either side of Sellafield has continued each day. Systematic monitoring by British Nuclear Fuels Ltd has been complemented by independent monitoring by the Ministry of Agriculture, Fisheries and Food, and the Department of the Environment. General radiation levels on the beaches are little changed from those normally observed. However, a small number of clumps of seaweed debris have washed up on the stretch of coast between St Bees Head and Eskmeals. These clumps show considerably higher than normal levels of radioactivity. They have been removed from the beach as soon as they have been found. No such clumps of seaweed have been discovered further afield. Authorising Departments have sent samples for analysis and assessment by the National Radiological Protection Board. Any risk of contamination to the public is extremely small. It might be wiser nonetheless for members of the public to avoid unnecessary use of the beaches (or swimming in the sea) on this stretch of coast for the time being. Monitoring of the beaches continues and the public will be kept informed.

30 November 1983

Figure 1. DOE Press Release

the train of events, and along with story A, constitutes the major focus of news media coverage of the November 1983 Sellafield incident. Although further related reportage continued over several months thereafter, it was more patchy and less intense. The main source material for story B is a DOE press release issued on the evening of the November 30th a week after story A (see figure 1).

6.1.1 HEADLINES

The headlines of the news reports (see Table 7) can again be grouped into 3 categories: (A) those referring to the finding of "radioactive seaweed"; (B) those also referring to the DOE advice concerning the use of the beaches; and (C) a group of local reports featuring the comments of Copeland Environmental Health Officer, Colin Evans (ITV local, Radio) on the forthcoming hearing of BNFL's application to seize Greenpeace's assets (BBC local).

Within the first two categories there are significant differences in sentiment. Some state that seaweed (in some cases "radioactive") has been found on the beach, whilst others dramatise these finds with the phrases "radiation alert", "seaweed-scare" and "Atom scare" respectively. In relation to the DOE advice, the Times refers to a "beach warning", the Guardian and Star less guardedly state the beach has been closed, the Whitehaven News declares firmly "Stay away from beaches" and the Mail and Express use billboard style headlines for dramatic effect with "No Swimming" and "Keep off the Beach", respectively. It can be seen from these headlines that the opportunity for sensationalising the story has in some cases been taken, and that the DOE advice against "unnecessary use" of the beach has quickly become simplified into a "beach closure". Very different evaluations and impressions of the significance of the

Table 7 News Report Headlines: Story B

<u>Source</u>	<u>Date</u>	<u>Headline</u>	<u>Group</u>
Times	1/12	"Sellafield beach warning over radioactive seaweed finds"	B
Guardian	1/12	"Sellafield weed closes beaches"	B
Telegraph	1/12	"N-plant seaweed scare"	A
Financial Times	1/12	"Radioactive seaweed found on beach"	A
Mail	1/12	"No Swimming: radioactive seaweed found"	B
Express	1/12	"Keep off the beach" alert over Windscale"	B
Mirror	1/12	"Radiation Alert over seaweed"	A
Star	1/12	"Nuclear seaweed closes a beach"	A
Sun	1/12	"Atom scare over weed on beaches"	A
M Star	1/12	"Radioactive seaweed washed up on beach near nuclear plant"	B
<u>Television</u>			
BBC National	30/11	"In Cumbria radioactive seaweed has been washed up on beaches near the Sellafield nuclear reprocessing plant formerly Windscale"	A
BBC NE	30/11	"BNF's who operate the Sellafield nuclear reprocessing plant in Cumbria have applied to the high court to seize the assets of Greenpeace"	
ITV National	30/11 PM	"People have been warned to stay off beaches near the Sellafield n.r.p. in Cumbria after clumps of radioactive seaweed have again been washed ashore"	B
Border TV	30/11	"Copelands Environmental Health Officer, Colin Evans has been reported late this afternoon as saying waste discharges at Sellafield should be stopped pending further investigations into the discovery of radioactive waste on a stretch of West Cumbrian beach"	C
<u>Radio</u>			
BBC Cumbria	1/12	"The Environmental Health Officer for Copeland, Colin Evans has called on BNF to stop all radioactive discharges from the Sellafield nuclear waste reprocessing plant until there's been more inquiries into the radioactive seaweed thats been washed up on West Cumbrian beaches"	C
<u>Local Press</u>			
Whitehaven News	1/12	"Stay away from beaches"	B

contamination and beach use advice are conveyed, setting the context for (and perhaps overriding) any more detailed discussion of these points later in the news reports.

6.1.2 CONTENT

Although as many as 78 points of information can be identified across news media reports as a whole, relatively few are held in common by a majority of reports (table 8). Isolating points featuring in 10 or more of the 15 news sources produces just the following list as the agreed core of the story:

1. DOE warned public to stay away from beaches.
2. Clumps of radioactive seaweed were washed up on the beach.
3. DOE figure for contamination.
4. DOE "Seaweed still low level radiation source."

The existence of only 4 points here (compared to 7 in story A), and only one which is included in all 15 reports, indicates a certain lack of agreement as to what really is important about the event as a news story (our story B). This is partly due to the low point totals of the Mirror and Telegraph and the difference between national and local perspectives. Examined separately, the national press is more agreed as to the significant core of the story. However, some reports do not mention the DOE beach use advice (point 1) at all. Amongst these are the The Morning Star, and perhaps more significantly, the local BBC news. The latter concentrates its news report on the forthcoming Greenpeace court case and the discovery of the seaweed. The neglect of any reference to the official DOE advice is a rare 'failure' of an important local information source (though reports on subsequent days cover this aspect).

It is significant that despite some of the dramatic headlines, the DOE

Table 8 Content Tabulation: Story B

POINTS	T	Gl	Te	FT	Ma	Ex	Mi	St	MS	BN	EL	IN	IL	R	WN	TOTAL
<u>DOE Announcement</u>																
1. DOE warned public to stay away from beaches	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	13
2. Warned to avoid "unnecessary use/not go swimming"	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	9
3. Clumps of radioactive seaweed washed up on beach	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	15
4. Contamination up to 1,000/100-1,000 times normal level	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	14
5. Number of clumps found	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6
6. Seaweed still low level radiation source	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	12
7. In direct contact might get max. dose in an hour	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
8. Risk of contamination extremely small	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	9
<u>Contamination</u>																
9. Samples being analysed by NRPB	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	8
10. Results expected in a week	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
11. RChemL, BNF and MAFF monitoring beaches	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7
12. Main Contamination is Ruthenium 106	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
13. NRPB analysis will indicate hazard	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
<u>Comment</u>																
14. BNF would not comment	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
15. BNF acknowledged could be from previous leak	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
16. BNF pledged to step up patrols	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
17. BNF are disposing of seaweed	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
18. BNF: discovery of more seaweed not serious	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
19. Colin Evans called for cessation of discharges	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4
20. William Waldegrave "only way to give confidence is to be open"	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
21. Greenpeace "contamination probably from previous slick"	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	7
22. Greenpeace demand all discharges are stopped	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
23. Greenpeace ask how often this has happened in the past	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
<u>Context</u>																
24. Third Incident in a fortnight	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
25. Previous leak closed beach for 24 hours	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6
26. Two weeks ago seaweed found	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
<u>Other Issues</u>																
27. BNF goes to court today to seize assets	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	6
28. Greenpeace unsuccessfully sent divers to block pipe	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	5
29. Greenpeace stopped attempt after court injunction	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
30. National Union Seamen calling for campaign against discharges	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	3
31. Union calls for tighter controls on nuclear waste ships	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	2
<u>Shared Points</u>	14	16	6	9	14	13	4	10	13	9	9	10	11	10	15	
<u>Unique Points</u>	5	7	0	6	1	1	0	1	0	4	5	5	0	18	0	
<u>TOTAL</u>	19	23	6	15	15	14	4	11	13	13	14	15	11	28	15	

comment that the seaweed is still a "low level source of radiation" is included in 12 news reports (excluded from ITV local, BBC national, and Mirror).

The comparatively large number of unique points identified in the news reports is due largely to the inclusion of more detail as to the nature of the contamination (e.g. 4 points in the Guardian), comment by such people as William Waldegrave and Colin Evans (13 points, on local radio), and the selection of related issues and stories to combine with coverage of beach contamination. Among the latter were comment on: BNF's court appeal (6 sources); a YTV documentary (only the Times); the National Union of Seamen's campaign (3 sources); a leak at Springfields (the Times building up a picture of heightened concern; and an NRPB study into natural radiation (Financial Times only)).

6.1.3 USE OF SOURCES

The DOE is the most often used source, with BNF and Greenpeace cited at a lower but almost equal level. The NRPB and William Waldegrave are also used quite a lot, particularly by certain individual reports (table 9). Local Environmental Health Officer Colin Evans is also featured prominently in local sources with the "other" category formed by the National Union of Seamen, the Ministry of Agriculture, Fisheries and Food, Patrick Jenkin and the District Council.

It is not surprising that the DOE features most heavily, as it is the main source of the information for the beach contamination story. The absence of attributed DOE points on the BBC news is accounted for by the lack of reference to who had "still classified (the radiation) as low level", who had "warned the public to stay off the beaches", and so on. This

Table 9 Attributed Points per Source

	T	Gu	Te	FT	Ma	Ex	Mi	St	S	MS	BN	BL	IN	IL	R	WN	TOTAL
Department of Environment	5	6	3	4	4	3	2	5	-	4		2	4	3	5	7	57
BNF	3	3	2	3	3				-	3	1	4	1	4	2	3	32
Greenpeace	3	2			2	2		3	-	2		5	2	1		5	27
NRPB	1	1		8				1	-		5			1		1	18
William Waldegrave									-				5		13		18
Colin Evans									-		1	1		1	8		11
Other	2	3		1		1							2			1	10

contrasts with the continual reference to DOE spokesmen and statements in, for example, the Whitehaven News.

BNF comments are included by all but 3 news reports. Out of the total of 32 points involving the company, 11 refer to the forthcoming court case. Of the others the FT, and Border TV state that BNF "discovered" the contamination. In other news sources the discovery is assigned to "officials" and "experts" which could also be meant to refer to employees of the company. Only two reports (Whitehaven News and Border TV) include a comment by BNF emphasising the smallness of the level of contamination, whilst in others the company are reported to have not wanted to comment on the DOE advice.

Greenpeace achieves a similar number of referrals overall to BNF but is excluded from a greater number of news reports. The most frequently included comment over the contamination of the beach is their surmise that it probably came from the same slick that the group discovered two weeks earlier. Only two reports (Star and Whitehaven News) include the group's demand that they be told how often such contamination has occurred in the past, with the Star featuring this quite prominently in its article. This again shows a selective use of Greenpeace as a source.

The NRPB is mentioned in 7 reports as the place where the seaweed is to be tested. In the FT and BBC news they are heavily referred to. The BBC national news features the NRPB the most prominently, with Science Correspondent James Wilkinson interviewing Geoff Webb of the Board, and filming the seaweed arriving at the laboratories in Oxfordshire and undergoing preliminary tests. Webb's comments form the main source of evaluation of the significance of the radiation hazard within the bulletin.

Colin Evans, the local Environmental Health Officer for Copeland Council achieves considerable prominence in the local reports through his comment that

" to show some degree of faith with the public in the area perhaps DOE or BNFL or both should cease all discharges to the Irish Sea, until one or other can satisfy the local public that the beaches and the radiation levels on those beaches are safe and of little or no risk to their health or their childrens health or whatever".

(Radio Cumbria AM 1/12/83)

In terms of the balance of participants within each source it can be seen that in the Times, Guardian, Mail, Express, Morning Star, BBC and ITV News, Greenpeace and BNF are fairly evenly represented. In the Financial Times and BBC National the NRPB dominates, in Border TV BNF dominates, and on local radio William Waldegrave and Colin Evans are most frequently included. The Star is the only news outlet to feature Greenpeace over other (non DOE) participants although the Whitehaven news also does this to a more marginal extent.

6.2 ACCURACY

As for story A, closer examination will be made of reportage of five 'factual' elements, under the same headings as before.

(1) The circumstances of the discharge

Matters clarified little in the period between stories A and B. (Not until December 15th did BNF reveal in any detail what had occurred, and even then only after a provocative ITV "exclusive" report.) Only two reports state that the company had admitted that the new contamination finds could have come from the earlier purex discharge (Radio and Guardian), whilst in others this is only a Greenpeace claim, and some give little indication as to the cause of the contamination (e.g. Morning Star). The number of

discharges that occurred is also a point of disagreement, with Greenpeace claiming there had been either one or two slicks, depending which reports are read. This is all testimony to the basic lack of hard information as to what had happened, and the confusion that was rife at the time.

(2) The nature of the discharge

Although more detail is available than at the time of story A, only 3 sources (all national papers) include the fact that the main contaminant is ruthenium 106 - all other simply refer to "radioactive seaweed" or to "radioactive contamination". Again the Guardian goes into the most detail, discussing the way in which Ruthenium 106 is accumulated in seaweed, which in turn used to be one of the limiting criteria for discharges because of laver bread eating.

(3) The level of radioactivity released

Very few sources make any reference to the level of radioactivity discharged from the plant. Most simply refer to "a slick" or "an oily Purex slick". The only example of a level being included is in the Guardian which refers to "the Purex discharge - a highly radioactive, oily slick". No reports link the more recent finds of contamination with the earlier competing claims over the level of radiation discharged from the plant.

(4) Length and location of beaches affected

The DOE's own press release refers to a "stretch of coast between St Bees Head and Eskmeals", a description which gives no distance measurement, and is not likely to mean anything to people who do not know the local area. Reporting this information, the Guardian, Mirror, Morning Star, BBC National and ITV National news reports refer simply to the beaches or coastline "near to the plant" with no limits or distances set. For people

living in or intending to visit the area, it would be up to their own interpretation of "near" to determine where the advice applied. The Financial Times and Telegraph are slightly more specific (if not accurate) in referring to "ten miles" of beach near the plant, whilst the Mail, Star, Express, ITV local, Whitehaven News, and Radio report that the ten miles in question lies between St Bees Head and Eskmeals. The Times also refers to these limiting points but states that the distance between them is only 5 miles (the quality press is not always the more accurate!). The BBC local news does not refer to this stretch of beach as coming under the DOE advice but in combination with a map showing St Bees Head and Eskmeals states that 15 miles of coastline is being "closely watched".

(5) Beach Use Restrictions

As already noted the media were used by the DOE as the sole medium of relaying to the public their advice about the use of the beaches (advice which was to hold for the subsequent nine and a half months). No other means of communication were utilised; no notices were posted (although a local protest group did attempt to do so, causing considerable controversy, Guardian 18/2/84). Media transmission of the DOE advice has been a particular source of complaint by BNF and local figures. For example Jake Kelly of BNF is reported to have complained that the media had been giving people the "wrong messages" over the DOE advice, referring to the beaches as "closed" when in fact it was only advice concerning "unnecessary use" (Cumberland Evening News 15/2/84). Similar complaints came from Alan Mounsey, Chairman of the Seascale parish council (Tyne-Tees/Border TV 24/2/84) and from local hoteliers and traders who claimed that tourists were keeping away from the area (Whitehaven News 5/4/84 and 7/6/84, Barrow News 20/1/84).

A distinction can be made between the general and specific versions of the DOE advice, namely "DOE warned public to stay away from beaches" and "DOE advised the public to avoid unnecessary use of beaches and not to go swimming", respectively. Eight reports include both of these points, initially referring to the general interpretation of advice and giving more details later in the article. The Guardian, Mirror, Radio, Border TV and ITV National however only include the more general interpretations, whilst the Morning Star (most faithfully) only refers to the more precise wording of the DOE. As discussed earlier the BBC local TV news does not mention the beach advice at all (on this day) a curious omission in this important local information source.

It can be seen that the wording through which the DOE's advice is transmitted through the media is far from consistent, or faithful to the original statement (table 10). In particular, differing degrees of compulsion to keep off the beach are conveyed. Seven statements indicate strong compulsion (annotated C). Some of these say that the beach has been closed (including the Star's evocative headline of "Nuclear Seaweed Closes Beach"!). Others use demonstrative orders ("no swimming" Daily Mail). Significantly 5 of these statements are headlines, and in 4 of these cases statements are included later in the report which use the terms of "advice" and "warning". This shows that the compulsion has been introduced in the writing of simplified headlines ("closed" is much shorter than "avoid unnecessary use of"), in the process distorting the original message. The Star is the only source to maintain a sense of compulsion further into the report with references to "ruled out of bounds" and "officially warned". This contrasts with its treatment of the earlier discharge story ("Atom slick: no danger").

Of somewhat lesser compulsion are statements which refer to the public

Table 10 Beach Advice References: Story B

SOURCE	BEACH ADVICE REFERENCES	ANNOTATION
Times	"Sellafield Beach Warning" (headline) DOE: "officially <u>advised</u> public to <u>avoid</u> unnecessary use . . . " DOE: "we are <u>not closing</u> the beach"	W A NC
Guardian	"Sellafield weed closes Beach" (headline) DOE: "has <u>warned</u> the public to <u>stay away</u> from the coastline" DOE: "the warning is a <u>matter of prudence</u> "	C W W
Telegraph	public "advised to avoid 10 miles of beach" DOE: " <u>might be wiser</u> if public <u>avoid</u> unnecessary use"	A A
Financial Times	"people were <u>warned</u> off the 10 mile beach" DOE: " <u>might be wiser</u> none the less for members of the public to <u>avoid</u> unnecessary use"	W A
Mail	" <u>No Swimming</u> " (headline) "people have been <u>warned</u> not to swim there" DOE: " <u>might be wise</u> to <u>avoid</u> a ten mile stretch of beach"	C W A
Express	" <u>Keep off</u> the beach" (headline) "people were warned to <u>keep away</u> from miles of beach" "spokesman <u>warned</u> the public to avoid beaches"	C W W
Mirror	DOE: " <u>advised</u> people to <u>avoid</u> beaches"	A
Star	"Nuclear seaweed closes beach" "A ten mile stretch of beach has been ruled out of bounds" "The public has been <u>officially warned</u> to <u>stay off the beach</u> . . . until further notice" DOE: "if the contamination had been considered dangerous we would have closed down the beaches completely"	C C W NC
Morning Star	"DOE <u>warned</u> the public to <u>avoid</u> unnecessary use . . . for the time being"	W
BBC National	"public is being <u>warned</u> not to use the beaches in the area unnecessarily"	W
BBC Local	---	
ITV National	"People have been <u>warned</u> to <u>stay off</u> beaches . . ." (headline) "People have been <u>warned</u> to <u>stay away</u> from the beach"	W W
Border TV	DOE: "has <u>advised</u> people to <u>stay off</u> the beaches"	A
Radio	"a warning from the DOE that people should stay away from beaches" "the <u>warning</u> that members of the public should <u>stay away</u> from West Cumbrian beaches for the time being came from the DOE" William Waldegrave: "help the industry and our inspectors to clear up the thing, by just <u>keeping clear</u> of these beaches for the time being please"	W W A
Whitehaven News	" <u>Stay away</u> from beaches" (headline) "Beaches near the plant have been put ' <u>out of bounds</u> ' by the DOE" DOE: "it would be <u>wise</u> for the public to <u>avoid</u> the beaches until further notice" DOE: "we would <u>advise</u> people to <u>stay away</u> from the beaches and not swim there"	C C A A

W = Warning A = Advice C = Closed/Compulsion NC = Not Closed

being "warned" to keep or stay away from, or to avoid the beaches.

Fourteen such statements are apparent, making it the dominant category (annotated W). Of lesser compulsion still (annotated A) are references to the public being "advised" or being told that "it might be wiser" (the actual DOE wording) to avoid the beaches, these being found 10 times. Finally, there are two statements which refer to beaches not being closed (NC), counterbalancing the tendency in other reports to turn advice into closure.

In relation to DOE's original wording, only the 'advisory' wordings are accurate, and even then only when alongside "avoid unnecessary use", not "stay away". These amount to a total of 12 references across 9 reports, with several of these submerged under banner headlines. On any strict definition of accuracy, the media performed badly in conveying the DOE advice.

It can be argued, however, that the DOE statement itself was badly worded (what is the meaning of "unnecessary use of a beach"?) and therefore that translation of their advice as a "warning" (cf strong compulsion) is perhaps not too serious a distortion of their message. Although statements about beach "closure" may at first sight seem to be more pronounced distortions, comments made by Greenpeace interpreted this as the true implication behind the 'mealy mouthed' wording of the DOE statement (see also Surveyor 1984).

6.3 RISK EVALUATIONS

The conveyed impression of the degree of risk on the beaches is perhaps more crucial for story B than for story A, as the beach use advice was to hold for many months, unlike the earlier more limited two day restriction.

The DOE advice (figure 1) of "avoiding the unnecessary use of the beaches" requires people to assess what "unnecessary use" means and to make some evaluation of how to react. In a local radio interview William Waldegrave stresses his intention for people to make their own evaluations:

"It seemed to us right to be completely open with the public so that the public, and particularly in your part of the world where you know a great deal about the nuclear industry, the public can assess exactly what has happened" (Radio Cumbria 1/12/83)

People's own evaluations would, of course, depend to a greater or lesser extent on what they 'heard' through the media.

6.3.1 RISK EVALUATION THROUGH USE OF SOURCES

The dominant source-related risk evaluations contained the news reports of Story B are three statements made by the DOE which are;

(i) that the seaweed found is contaminated with between 100 and 1,000 times the normal level of radioactivity; (ii) that this is classified as low level radiation; and (iii) that the risk of contamination is very small. The figures "100 to 1,000 times" in the first statement are sometimes condensed into "up to 1,000 times". One of the problems facing the DOE here is that the figure of 1,000 times normal may intuitively appear to be a very high figure, and in turn suggest a high level of danger.

All reports (even those of very short length) contain DOE statement (1) and either or both of statements (2) and (3) (see section 6.1.2). In all cases, therefore, both the DOE's figure for the radiation level and at least one of their reassuring or "negligible risk" messages are included together, giving (at first sight) substantial and balanced coverage of the DOE's position. No reports give simply the figure without a context statement as well, but such statement counting hides differences in treatment between sources which can put a very different complexion on DOE's message. The picture becomes less balanced, anyway, if we examine

what other (non DOE) views and evaluations are presented in the reports. These turn out to be sources which "play down" potential risk - BNF, NRPB and William Waldegrave. In fact, there is no specifically voiced concern about 'risk' on the beach on this days media reporting. Any criticism is more general in nature, for example, with Colin Evans calling for the cessation of discharges and Greenpeace questioning how often such discharges had happened before, claiming that BNF are only taking action because of recent public concern. Interestingly, the ITV National News turns Colin Evans' comment into the statement that 'the local district council may decide to ask that dumping be suspended pending further scientific investigations' - a distortion about which the District Council themselves later complained (Border TV PM 1/12/83).

6.3.2 BALANCE OF RISK EVALUATION

The above is not to argue, however, that all the risk evaluations conveyed by the news reports play down the risks involved. The news sources themselves introduced evaluations and gave different interpretations to the DOE messages, through their placement, framing and context.

An example of selective placement is found in the Times and Morning Star articles opening with DOE statement (1), and leaving this unqualified by statements (2) or (3) until later in their reports. In the Times these low risk statements do not appear until half way through the articles with the first half building up a dramatic disclosure tone, through the sequential juxtaposition of the DOE advice, NRPB testing, Patrick Jenkins demanding a full report and an "unreported leak" at BNF's Springfield factory (with the Sellafield contamination described as "close on the heels" of this disclosure). When the low risk statements do appear they are comprehensive, but are described as the DOE "attempting to play down the radioactive seaweed find". Most other reports, such as those of the Mail,

Financial Times and TV, connect DOE statement 1 closely with 2 or 3 (often with the joining "but") giving an immediate context for the 100 to 1,000 times figure.

A further aspect of the risk evaluations given is the use of broader contextual information. It has already been noted how other recent events and "disclosures" are emphasised by the Times in a way which suggests an increasing problem. More directly related to risk is the statement in the Guardian that:

"routine discharges already produce the most radioactive seaweed in Europe"

The Guardian is the only source to include this (unattributed) remark, but it obviously indicates that the additional contamination is being added to what is already a "worst case" situation. The Financial Times on the other hand emphasises the handling of the incident through the procedures of notification and scientific analysis by the NRPB (in this case conveying a reassurance). The BBC news also stresses this aspect of the handling of the incident with a film and interview at the NRPB laboratories, but at the same time sets the significance of the event in a wider context:

"The radioactive hazard may or may not be significant, but the discovery of yet more contamination on the beach is very damaging to the nuclear industry, particularly at a time when they're trying to persuade people that nuclear power is safe".

Exceptionally, an attributed source which directly plays up the level of risk, is a radio presenter who questions the reassurances being given by the DOE during an interview with William Waldegrave:

"It's difficult to say how serious the department exactly thinks this is because on the one hand you say that people could hold the seaweed to their skin for hours at a time and it wouldn't have any ill effect, but on the other hand you're recommending that people don't go on a very large stretch of beach, 15 miles in all".

Such considerations do not enter any of the other reports at this stage, although as the debate developed over the next few months it was the sort of argument being put forward by local environmentalists and letter writers in the national newspapers.

6.3.3 RISK EVALUATION THROUGH USE OF LANGUAGE

Media created risk evaluation can also be discerned in the differential juxtaposition of statements and words. This is most apparent in the use of the subsidiary DOE statement concerning the radiation dose that could be achieved through direct contact with the contaminated seaweed. In the Guardian this comment is placed following DOE low risk statement (2) and reported as:

"But the radiochemical inspectorate says that people in direct contact with the seaweed might accumulate the permitted maximum external dose in about an hour. This dose rate is high".

The additional sentence at the end, and "but" at the beginning, makes this statement appear as one emphasising the level of risk. In contrast in the Mail the DOE comment is reported as:

"To exceed the annual permitted exposure the seaweed would have to be held for at least an hour - which is "very unlikely" said a Department Official".

In this case the inclusion of the phrase "at least" an hour and the comment quoted from the DOE, makes the statement appear as one playing down the risk or showing the unlikelihood of any significant contamination. Another interpretation of this statement is given by the Whitehaven News which quotes a DOE official as saying:

"The severely affected seaweed could be dangerous if it was held for any length of time."

This is vaguer than the others, and the lack of definition of "length of time" gives no real indication of the level of risk. All in all, a single comment from the DOE can be diversely transmitted through selective wording and framing within news reports.

Overall, the analysis of story B shows a number of similarities with the story A in the diversity of headline interpretation, the dominance of the BNF and government as a source, the more selective use of Greenpeaces comments, and the differences in extent and comprehensiveness of coverage (although the same sources do not necessarily exhibit the same characteristics for each story). There is a lower level of agreement on the core of Story B, with some reports failing to give what is basic information concerning the beach use advice.

7. CONCLUSIONS

Elementary familiarity with the news media would lead one to expect to be given different information and impressions from different reports of a given event. This expectation is amply borne out in the analysis above. There are different sentiments - alarm, calm, danger, reassurance - more or less consistently projected in individual outlets: the Guardian gives a picture of serious risk; the Financial Times a picture of control and containment; the Daily Star with no consistent position. There are different levels of detail, more in the quality than in the popular press, as would be expected, and TV and radio relying more on interviews. There are different selections and emphases in the material used. Beyond confirmation of such expectations, we can comment more acutely on the issues of media accuracy - the distortions from 'truth' in the accounts of events - and on media risk evaluation - overtly value laden elements of reportage - and more generally on the performance of the media as transmitter of hazard incident information. We can ask, in particular, whether there are grounds for calling for improvement in the state of affairs we have encountered.

(1) Accuracy. The noteworthy shortfalls from accuracy which have been brought to light can be explained to a degree in terms of forces beyond the media's own control, notably the conflicting and ambiguous information on which it had to draw (this was also seen elsewhere at the Three Mile Island incident), and the special problems which nuclear risk information holds for media presentation. Other factors, such as carelessness, ignorance, prejudice, pressure to meet deadlines or liven a story, for which media have some control, introduced further muddle. An obvious example is found in the different figures in story A about the amount of radioactivity discharged. In general, it was not merely a matter of the media having problems with the presentation of science, as others have found, and we have illustrated in particular detail above. Elementary facts, such as the length and location of a particular stretch of beach, were also misreported. For whatever reason, semi-fiction and drama are well established elements of news media reportage. Inaccuracies go largely uncorrected by informed audiences (exceptions being occasional entries in correspondence columns; the number which are stifled cannot be known), and largely unnoticed by uninformed audiences. Our analysis gives detailed confirmation of trends already suggested in the literature. We note in this connection that, in the absence of first hand knowledge of a particular subject, detailed cross sectional analysis of the kind presented above can be a particularly effective way of uncovering inaccuracy: only when one is confronted with different accounts or descriptions of a given subject or event may one suspect inaccuracies in one, more, or perhaps all of them. (We observe in passing that some reports presented divergent accounts of events explicitly, whilst others did little to acknowledge disagreement and its possible significance.)

It remains to assess whether inaccuracy matters; whether it is of sufficient degree to warrant call for change. After all, though

noteworthy, inaccuracies such as encountered in the analysis above might be regarded to be tolerable in degree: and there is seemingly a broad cultural acceptance of the status quo on the part of audiences. We would argue that higher standards would be desirable on at least four grounds. First, as a matter of journalistic ethic, wilful inaccuracy is wrong in principle. Second, if we understand the media as an embodiment of the level of appreciation of the issues by their audiences, then 'unnecessary' inaccuracy in media reporting will contrive to maintain that appreciation at an unduly low level. This, in turn, will limit people's capacity to understand the issues and reflect and debate on them - ultimately limiting their ability democratically to participate in related public policy decisions. Third, inaccuracy can constitute an artificial influence on people's opinions, the correction of which may prompt opinions to change. Fourth, uncorrected inaccuracies can have a tendency to become further exaggerated and falsified, as with the erroneous references to beaches being 'fenced off' in the Christmas review on Radio Cumbria.

(2) Risk evaluations. Diverse media evaluations of the risk aspects of events have been presented, many with particular reference to uses of language, and selection of contextual information. In some cases, these departures from 'objective' reporting of subjects and events were inevitable, due to the natural ambiguity of the english language, with its fusion of 'factual' with 'value-laden' elements. The intrinsic social and institutional connotations surrounding the concept of risk is a contributing factor to this source of departure from 'objective' reporting. In other cases, the absence of neutral contextual information (reference levels for 'safe' radiation concentrations, for example) rendered 'objective' reporting impossible. These kinds of problems were particularly apparent where reports were short, or where simple versions

of complex issues were sought, such as in the creation of a 'catchy' headline, necessitating extreme compression of wording. At the same time, more extreme risk evaluations were often encountered. Although neither coverage of story A nor that of story B included the blatantly sensationalist evaluations found in other nuclear news stories (we encountered references in other Sellafield-related media research to deformed calves and big and strangely coloured spiders, Macgill 1987, chapter 2), there were notable instances of undue extremity: 'Nuclear seaweed closes beach'.

We suggest that improvement would be desirable on the same four grounds as those given above in the context of 'accuracy': as a matter of principle; to avoid unduly debasing the level of audience appreciation of the issues; to minimise the extent of artificial influences on people's opinions; and to prevent further falsification. The most immediate need is perhaps for research into appropriate forms of language for more balanced and less ambiguous representation of nuclear risk information for various audiences. In the UK context in particular, there is very little by way of a research base on which any intended improvements in practice could build and draw.

The above suggestion for more measured reportage is not to argue for as complete an elimination as possible of value-laden elements. It is, rather, to argue for elimination of blatant, arbitrary or debasing extremes, and for keener appreciation of the complex and subtle ways in which risk evaluations can arise.

For example, a predilection for dramatic news value would tend to favour implicitly anti-nuclear sentiment in risk evaluations, suggestions of danger being more dramatic than suggestions of calm. However, the

particular political attitude to the nuclear industry and to the deemed hazards of low level radiation in accordance with which many reports will have been prepared will not necessarily project an anti-nuclear sentiment. Moreover, our examination of the manner and extent to which different information sources were used by the media finds BNF and government (both pro-nuclear) the most frequently and widely attributed sources; also the source of much unattributed material. To an extent this was to be expected, as they were at the centre of events, and in some cases were the only available (command post) source of relevant information - for example, on the extent of contamination, and readings taken. This runs counter to any prior expectations that the media overall will have an anti-nuclear bias. The use of other sources, such as Greenpeace and workers, was more sketchy and seemingly more cautious in the majority of reports. Moreover, the sparse use of workers accounts, at the time more accurate than the version of events portrayed by BNF management, did little to give audiences accurate information.

(3) Transmission of risk incident information. In the circumstances of a controversial, topical and dramatic issue, such as the November 1983 beach contamination incident at Sellafield, our analysis of inaccuracies in reporting would indicate that the media cannot be relied upon for the transmission of important information from central authorities to wider publics. The process of simplification from source to news report, and report to headline will almost inevitably lead to innaccuracy and distortion of the intended message. In the case we have considered, the unduly ambiguous wording of the official statement (notably the curious reference to 'unnecessary use' of a beach) is a shortcoming for future statements to avoid. Reliance on mass media news as the sole channel of transmission is a further matter to remedy.

Beyond these considerations of risk information as transmitted through the news media, are considerations about the way that information is received and interpreted by various audiences. This remains a matter for further research. Media communications about risk may have to permeate channels of reception which are largely subconscious and not overtly risk related. Impacts on readers cannot reliably be predicted. Risk is a component of many wider issues and connotations - credibility, trust, economic dependence. People's reception and response to related information will depend not only on what the media portray as 'dangerous' or 'safe', but on the combined forces of many additional complex and subtle influences.

FOOTNOTES

- [*1] This is not to ignore cultural, psychological, ideological and political forces on opinion of other origins; nor mass media communications of other forms - films, documentaries, literature, and so on. However, for categories of events which are outside people's everyday experience and not intuitively understood, mass media news reportage can have a particularly significant potential (see also Zucker 1978; Lowe and Morrisson 1984).
- [*2] Before the discharge incident the Sellafield plant was also an important news topics, with controversy raging over its longer term impact on the health of the local population after a documentary (Yorkshire Television 1983) shown on 1st November alleged a link between emissions from the plant and a high number of cases of leukaemia in local children. This programme and the argument it generated led to the setting up of a government inquiry to investigate the allegations made (Black 1984). Sellafield was therefore already and object of media attention (or on the news agenda) by the middle of November and indeed nuclear issues generally had been of news interest all year (the Sizewell inquiry, the search by NIREX for waste sites; sea dumping controversy; see Blowers and Lowry 1985). The two stories examined in the present paper must therefore be viewed in this wider context, and care taken in presuming wider applicability of any conclusions reached (but see other work undertaken on different aspects of recent Sellafield controversy: Macgill 1987).
- [*3] BNF and local residents (campaigning at one stage under the acronym COMM - Cumbrians Opposed to Media Misrepresentation), amongst others, have complained about the content of some media coverage and the damage this has done to the image of BNF and the area in general and also to local tourism and fishing industries.
- [*4] The news cutting collections of James Cutler, producer of the YTV documentary and of BNFL's information services department were utilised with their kind permission and assistance.
- [*5] A significance subsequently played down by Waldegrave himself in a later Commons statement (Hansard) and in a letter to the Daily Telegraph (Waldegrave 2/12/83).

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