

Examining the psychological underpinnings of Chernobyl and after

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Abstract : A safety test in Reactor No. 4 at the Vladimir Lenin Power Plant near Pripyat, Ukraine, in the early hours of 26 April, 1986, led to one of the worst nuclear disasters in history. The ensuing events included attempts to control the information available regarding the explosion. The current study analyses the accident at Chernobyl in light of the psychological factors that played a role in causing it, and in the aftermath. The material analysed includes a report on an international conference (IAEA) where the incident was discussed at length, an interview with Valery Legasov, a key person in the dealing of the aftermath, and tape recordings left by him before his death, and a journalistic article on the concealment mechanisms employed by the State. The method of analysis was thematic analysis, and the key points that emerged are secrecy, obedience, power dynamics, avoidance of panic, and various patterns of information dissemination. The themes show how a pattern of concealment and emphasis on fixed roles and hierarchy may have played a role in causing the incident at Chernobyl, and how the fallout was navigated. The study shows the role of psychological factors in the functioning of institutions, when dealing with disasters and emergencies, including decision-making, risk management, information management, and international relations.

Keywords: obedience, secrecy, mass panic, power dynamics, Chernobyl

If history is understood as an account of human pasts, it can also be thought of as a record of human behaviours and their consequences. As put by Gergen (1973), the concern of psychology is to study human behaviour, and “theories of social behaviour are primarily reflections of contemporary history” (p. 309). He also points out that a social psychologist works to derive laws of behaviour that can then be applied to understand the interaction between and among people. World War II and its aftermath necessitated the field itself. The early decades of social psychological research were focused on creating foundational concepts such as conformity, social learning, discrimination, and so on (Cartwright, 1979). Hence, we chose to explore the Chernobyl incident in light of the social psychological processes that were involved. We were interested in the deep-rooted processes and features of the society that gave rise to and dealt with the fallout of a catastrophe of this scale. Societies and political structures are complex systems that are made up of people, and hence, can be subjected to the psychological lens to understand the causes and effects of the behaviours they give rise to.

Power Plant near Pripyat, Ukraine, in the early hours of 26 April 1986, led to one of the worst nuclear disasters in human history. The objective had been to test the emergency mechanisms of the reactor in the event of a power outage. To emulate such a condition, power levels were lowered, an action that eventually got out of hand and resulted in a fire and explosion of the reactor. Severely radioactive materials like iodine, caesium, strontium, and graphite were scattered around the site. Clean up efforts included deploying ‘liquidators’, including firefighters, workers in the power plant, and miners from different Soviets. Ukraine, Belarus, and Russia were the worst affected areas within the USSR, however, the impact was felt even in Scandinavia, other parts of Europe, China, Japan, Canada, and the United States in subsequent days. Around 115,000 people were evacuated from contiguous areas (UNSCEAR, 1988).

Chernobyl is of interest in psychology as it shows a pattern of behaviours exhibited on the systemic and institutional level, also by the personnel involved. Concepts of hierarchy and obedience were of salience in the Soviet state. Ukraine had a history of striving for independence from the Soviet Union. The Soviet Union employed propaganda to discredit this

A safety test in Reactor No. 4 at the Vladimir Lenin

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movement, despite the human rights violations that Ukrainians had been subjected to (Marples, 1991). Though the Chernobyl incident was situated in a period of Glasnost, literally meaning openness, where the Soviet state began recognising freedom of press, the dissemination of information regarding the explosion was inadequate. The policy of Glasnost was implemented for the media, where dissent was also slowly incorporated into publications and films, as well as in political matters, as evidenced by the relaxation in the treatment of dissidents. However, the policy operated within the caveat that the ruling party could not be brought under criticism (Lowe, 2013). In the context of the Cold War, when the United States warned against the dangers of nuclear weapons and advocated for peaceful uses of nuclear energy, the Soviet Union responded by getting involved in the creation of the International Atomic Energy Agency (IAEA) in 1957, which would allow it a stake in the global activities related to nuclear energy and prevent the USA from dominating them (Holloway, 2016). Even though the Soviets had proposed a law that would ensure nuclear safety, they did not implement it (Yaroshinskaya, 2006). Hence, despite the ideal behind Glasnost, the Soviet state covered up Chernobyl and the casualties it caused.

The current study seeks to explore the psychological patterns displayed through the behaviour of authority and institutions, forming a structure that impacts the individuals who are both parts of the system, and those who are subject to it. Apart from systemic factors that had a causal role, dealing with the aftermath also displayed the use of psychology in trying to control the information that is freely available to the people, perspective setting, and giving the perception of normalcy. The dependence on established hierarchies and roles is evident in the functioning of the state and the handling of the incident.

Chernobyl in the Social Sciences

Chernobyl has been the focus of studies within the social sciences, specifically how policymaking is influenced by disasters and crises, (Nohrstedt, 2008) interplay of the state, political bodies, and non-governmental actors, (Stsiapanau, 2010) how risk is dealt with as a society, (Beck, 1987) and other socio-

cultural changes induced by the incident (Nesvetajlov, 1992). There have also been studies from the perspective of mental health and developmental effects (Bromet et al., 2011). The foremost health consequence of Chernobyl has been the impact on mental health, specifically of the clean-up personnel and people residing in the area. These include symptoms relating to cognitive processes like memory and concentration, as well as more generalised health effects like fatigue and sleep changes (Pastel, 2002). In nearby locales, it was found that there was more prevalence of psychological disorders, compared to areas that were further away, more so in mothers who had children below 18 years of age (Havenaar, et al., 1997). Individuals exposed to Chernobyl-related radiation in Norway were also observed to have prenatal effects extending into adolescence (Heiervang et al., 2010). Further, psychological research has investigated Chernobyl in light of the perception of nuclear energy and related phenomena, decision and policy-making, risk perception, and communication (Eiser et al., 1990; Van der Pligt & Midden, 1990; Renn, 1990).

While the above research explores the psychological aspects of mental health, attitudes towards related phenomena, and perceptions involved in Chernobyl, there has not been much focus on the group processes that were prevalent in the state and political structures. The previous research explores politics of policy making in the wake of a disaster and the resultant perception of nuclear energy, however, it has not adequately looked into the fundamental group processes and dynamics that underlie the incident. The Chernobyl incident, specifically, was chosen as the focus of the present study, as there is a lack of a social psychological view of the causes and aftermath of the event. Further, the backdrop of the Cold War and the Soviet Union form an interesting base from which to study the social psychology of historical events.

The Present Study

Given the interlinkage of social psychology and historical events, the present study seeks to explore the psychology underlying the causation and aftermath of the Chernobyl incident, in light of the social, cultural, and systemic factors that played a role. The larger goal is to use the case of Chernobyl as a glimpse into the psychology of how societies and authority institutions

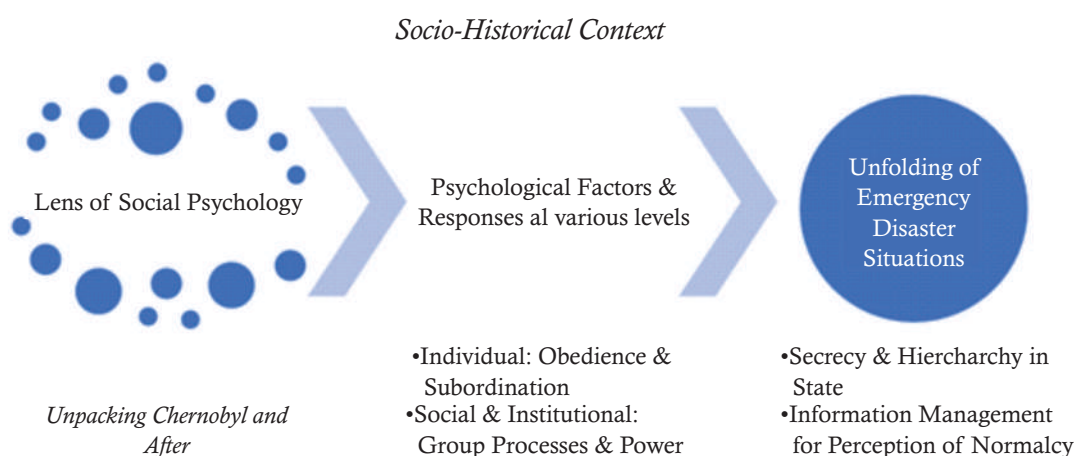
deal with emergency and disaster situations. Hence, the group processes at play are of key interest.

Therefore, the current study seeks to explore the psychology of the individuals and the system that caused and dealt with the aftermath of Chernobyl. This is done by asking the question: What is the psychology behind the subordination of facts and safety, to the mechanisms of the state? Behind a web of bureaucratic and state mechanisms that seem to be intertwined with the incident, there is the underlying

influence of the psychology of power, and all the reinforcements that are necessary to maintain it. There is a constant struggle between this power and the duty that is owed to the people in the face of a disaster. The impact of the struggle is also seen in the individuals involved, in their capacity as constituents of a larger system. This conceptual framework is demonstrated in Figure 1.

Figure 1

Concept map of the theoretical framework of the study



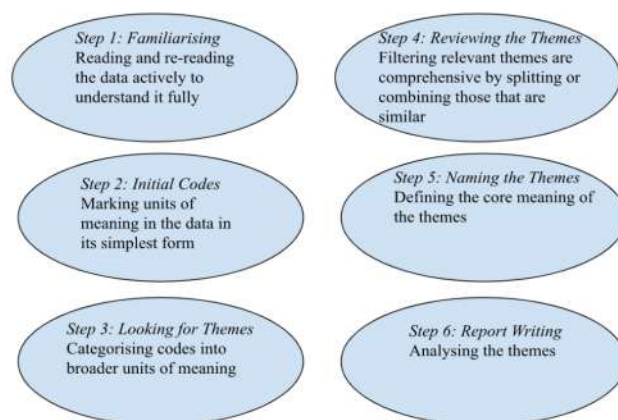
The present study used material that gave insight into the factors that led to the accident, and the mechanisms of the system that were responsible. Also relevant was material on the aftermath, and how it was dealt with as a public crisis. The social psychological constructs implicated in the material are highlighted.

Method

Analysis was done using the six-step process of thematic analysis as given by Braun and Clarke (2006), as illustrated in Figure 2.

Figure 2

Six-step process of thematic analysis given by Braun and Clarke (2006)



The first source is an interview given by Valery Legasov, the head of the committee that was created to deal with the effects of Chernobyl, done in 1987, a year after the explosion. The interview discusses the condition of the population, clean-up efforts, and further steps taken to ensure safety. The next source used is a report by Walter Patterson (1986) on the Vienna conference of the International Atomic Energy

Agency (IAEA), where a Soviet delegation gave details about the incident on an international platform. The third source is an article by Alla Yaroshinskaia (2006) who is a journalist, on state's attempts to conceal information in the aftermath of Chernobyl. The fourth and final source used is the translated transcripts of audio tapes left by Legasov before his death in 1988. The table below contains the sources used.

Table 1

Data sets used for thematic analysis, author/source and year, and reference codes used

Data Set	Author/Source and Year	Reference Codes
"A Soviet expert discusses Chernobyl"	Valery Legasov (1987)	D1
"Chernobyl- the official story"	Walter Patterson (1986)	D2
"The big lie- The secret Chernobyl documents"	Alla Yaroshinskaia (2006)	D3
"The Legasov Tapes"	Valery Legasov (1988), translated by Yury Timofeyev on https://legasovtapetranslation.blogspot.com/	D4

Results

Table 2

Table showing themes and codes from the data sets

Themes	Codes
Role of obedience and power dynamics in structures: factors in causes and effects of the incident	Emphasis on the goals of the state Maintaining international image Rectifying criticisms from Western countries Public relations success on an international forum Emphasis on the goals of the State Emphasis on the fixed roles and responsibilities Reliance on established procedure Lack of questioning among personnel Separation of the state and the work of scientific institutions Autonomy of scientific work Subordination of science to the state No heed paid to scientific concerns Emphasis on fixed roles Honour prioritised over safety

Secrecy, concealment, and manipulation of relevant information

Contrast between media for Soviet vs. international audiences
Optimistic picture
Concealing facts about the consequences on different levels
Restricting access to information
Dishonesty about radiation effect on people
Manipulation of diagnoses and medical records
Restricting access to information
Transparency in the face of scrutiny from international actors
Losing of standards on radiation-related sickness
Manipulation of diagnoses and treatment
Tampering with medical records
Political intervention in medical decisions and records
Concealment of facts to hide economic implications
Manipulation of medical records

Avoidance of panic through projection of normalcy

Putting severity in perspective, relative to other accidents
Mention of normalcy
Dealing with the health of first responders
Providing perspective on long term health effects
Full picture not given to avoid panic

Differential dissemination and disclosure of information

Admission of seriousness
Information given in-depth
Details of incident given
Transparency about the incident
Admission of severity
Transparency about structural flaws
Honesty about the incident to undo previous lapses in giving information
Uncertainty about the situation
Lack of instructions to the masses
Legasov's desire for transparency
No action taken to provide information
Lack of credible scientific information
Incomplete and unclear information about the causes
Poor planning of the test
Incomplete instructions given to personnel
Flaws in documentation
Lack of transparency regarding evacuation

Discussion

The aim of the study being to explore the psychological constructs implicated in Chernobyl, the themes that emerged in the analysis of the four data sources had to do with obedience and power dynamics, secrecy and concealment, avoidance of panic, and differential patterns of information dissemination based on different factors. These concepts seemed to broadly describe the behaviour that was observed in the data.

Obedience and Power Dynamics in Structures: Factors in Causes and Effects of the Incident

The following verbatim exhibits the importance attributed to obedience and power dynamics “...*the institution in which we all worked was built on principles of the highest qualifications of people who were executing any operation with the highest responsibility*” (D4) showing the emphasis on the rigid roles of individuals as a part of larger institutions. Further, “...*a generation of engineers came up who were very competent, but not critical of the devices themselves, not critical of all the systems that were ensuring their safety;*” (D4) succinctly expresses how the culture, even in scientific spaces, was one of non-questioning and compliance to the established rules and structures. A recurring code within this theme was that of emphasis on the larger goals of the state, as seen in “...*he said that they had somewhat messed something up, and an accident of sort had occurred there, but this would not stop the overall development of the atomic energy program.*” (D4) further shows the prioritisation of the collective goal over the immediate needs of those affected. There was also reliance on established procedures, (“...*highly qualified people who were used to being relied on, and were convinced that safety issues are solved solely by skills and by precisely instructing the personnel that led the process.*” from D4) that displays a desire to avoid uncertain terrains, and a sense of safety and continuity derived from tried and tested methods and activities. Another dominant observation was that of maintaining an international image and power dynamic, in the light of the power play that was prominent during the Cold War. “...*the Western delegations had drastically muted their criticisms of Soviet nuclear technology*” (D2).

Dordevic (2015) attributes the decision-making at Chernobyl to the Logic of Appropriateness model given by March (1994). It is characterised by decisions

that are made keeping in mind the role and position one occupies in a system, as opposed to the Logic of Consequence, which involves decision-making, keeping in mind the possible outcomes of the decisions. The former creates constraints based on identities and roles, the situation, and the rules in place. Stanley Milgram's (1963) experiment on obedience also showed that people follow instructions given by authority figures, even if the consequences can cause harm, whether the source of the authority be legal or moral (McLeod, 2007). The innateness of obedience is also caused by institutional influence (Zimbardo, 1974). The prison experiment at Stanford (Zimbardo et al., 1971) showed how fixed roles can affect behaviour even when it can cause harm to others. Thus, the behaviour discussed above can be attributed to these findings. The steadfastness of roles has the power to dictate behaviour, when operating within a rigid power structure. Hofstede's dimensions (Hofstede, 2011) of power distance, collectivism, and long-term orientation are also of interest. Power distance is described as the expectation regarding equal power distributions among members of a given society that have different positions, in relation to power. The degree to which inequality of power is accepted is also implicated in this dimension. Collectivism refers to how integrated individuals are into larger society and is characterised by group consciousness and decision-making that is reflective of the collective will. Uncertainty avoidance is indicative of the general approach to uncertain situations and navigation of situations where structure is lacking, characterised by set rules of conduct, and negative reactions to anything that falls beyond these defined boundaries. Russia scored 93 in the power distance dimension, 39 in the individualism dimension (indicating a leaning towards collectivism), and 95 in the uncertainty avoidance dimension, showing the large distance between those with and without power, importance attributed to group functioning, and a feeling of threat towards uncertain situations, as reflected through their fixed bureaucracy system (Hofstede Insights).

Secrecy, Concealment, and Manipulation of Relevant Information

One such action pertaining to this theme was that of maintaining a disparity in media shown to international and Soviet audiences: “*The film offered a*

grim contrast to the Soviet television documentary being shown in the delegates' lounge. The doggedly cheerful documentary devoted most of its time to the efforts of the workers" (D2). There was concealment of facts, including the effect of radiation, and medical records and diagnoses ("These regulations demanded that medical staff must not enter a diagnosis of "acute radiation syndrome" in the files of liquidators from the armed forces but must substitute some other term." from D3). Overall, the authorities covered up the impact of the explosion, political, economic, and health-related ("It had become a matter of economics: the USSR could not afford to resettle so many people. The truth about the health of the population had to be concealed from the population itself." from D3).

The act of secrecy involves not revealing information, as well as providing an alternate, untruthful account of the information at hand (Slepian, Chun & Mason, 2017). A characteristic of a restrained society, as per Hofstede's Dimensions (Hofstede, 2011) is the relative lack of importance attributed to freedom of speech. Shlyakhter and Wilson (1992) attribute the Chernobyl incident to failures and secrecy of Soviet bureaucracy that served as protection for their lack of understanding of the issues at hand. Hence, there is a culture of concealment observed, reinforced through mechanisms of manipulation. They also prioritised the long-term objective, which also aligns with Hofstede's dimension. It is characterised by goal achievement through faith in hierarchy. Further, it has been observed that higher levels of out-group bias is seen in individuals with authoritarian personalities (Downing & Monaco, 1986). This may also have influenced the way information was handled domestically, and abroad.

Avoidance of Panic Through Projection of Normalcy

Panic was avoided by portraying the situation as being normal or under control, achieved by comparing the effects to that of other events and accidents, to keep things in perspective ("...the history of our time knows accidents when human losses were greater by many orders of magnitude. If we regard the Chernobyl breakdown in this respect, it is not the most terrible" from D1). Further, "They lead quite a normal life external radiation" demonstrates that there was an attempt to project a picture of

normality about the livelihood of the people. The state also withheld information about evacuation to avoid panic: "Because I reasoned, for example, that if we say this to the people now, the evacuation will be delayed...People will start to pack for too long. That is why I advised...that we cannot tell about the precise duration of the evacuation yet." (D4). Hence, there is an overall impression of presenting the situation as being in control to avoid negative reactions.

Gantt and Gantt (2012) explain how, contrary to the notion of mass panic in the face of disaster situations, people tend to engage in helpful behaviour, and that the broad situations that cause panic are ones in which there is a perceived threat, perceived lack of escape, and helplessness. The social attachment model (Mawson, 2005) states the tendency to search for groups and situations that are familiar and known to be safe. This, too, suggests the likelihood of acting in groups in emergencies, and that of prosocial behaviour. However, a response of mass panic can occur in dangerous situations in the relative absence of close relationships, thereby offsetting the feeling of attachment. Hence, the incidence of mass panic in emergency or disaster situations is not only unlikely, but a rare occurrence. It is seen here that due to the steep consequences of the accident, there is denial of the severity.

Omer (1991) presented the continuity principle which delineates the need for continuity on all levels, in the course of managing a disaster. One such level is the functional level, the continuity of which entails adequate coping, and carrying on with necessary activities and functions, even when there is an emergency situation. There are thought to be two biases that preclude this continuity: the abnormalcy and normalcy biases (Omer & Alon, 1994). The abnormalcy bias is the tendency to underestimate people's capacity of coping and shaping up to requirements in a disaster. Conversely, the normalcy bias is the tendency to underestimate the damage that is caused by the disaster. Both these biases affect the achievement of continuity by disregarding both the disaster itself, and the people who have to deal with it. The coincidence of these phenomena, according to Omer and Alon, can occur when information is withheld, lest there be adverse reactions among the

people, while making the erroneous assumption that there is not a significant danger. This aligns exactly with what is observed in the data.

Shylakhter and Wilson (1992) attribute the accident at Chernobyl to, among other factors, ignorance. Concealment of information was done under the rationale of it being beyond the understanding of people. However, this could also be a reflection of the lack of understanding among bureaucratic personnel. This ignorance and lack of understanding can also severely implicate emergency responses, both in terms of causation and handling of the aftermath (Smithson, 1990).

Differential Dissemination and Disclosure of Information

The differences in how much information was disclosed was based on several factors, one of which was the need to go into detail and admit the seriousness on an international platform, as indicated through the verbatim: *"Although the consequences of the Chernobyl disaster are very serious-31 people have perished, over 200 persons have acquired radiation sickness..."* (D1). This disclosure also served the purpose of mitigating the lack of transparency until that point (*"Their forthrightness and candour all but blotted out the memory of the initial Soviet failure to warn their neighbours about Chernobyl."* from D2). Even in the immediate aftermath, there was a lack of clarity on the course to be taken, due to faulty communication, as expressed in *"There was no understanding of the steps that needed to be taken, neither from station personnel nor from the Ministry of Energy"*. Even the people weren't equipped with necessary information, and recommendations to provide it weren't acted upon: *"I have already mentioned that I had proposed from the beginning to create a press group under the Government Commission that would correctly inform the population about the events that were happening, that would give the right advice. For some reason, this was not accepted"* (D4).

The patterns of dissemination of information described above can be viewed through the perspective of decision-making. Janis (1971) describes the phenomenon of groupthink which is the tendency of groups to conform to established norms while making decisions. There is a sense of commitment to the

decisions of the group, regardless of the outcome. There are certain "symptoms" that are seen to be characteristic of this phenomenon. One such characteristic is a belief in the bulletproof nature of the decisions taken, which are often erroneous. Further, there is an engagement in rationalisation as a way to offset criticism, as well as a stereotypical and negative view of "the other". This reinforces the commitment to the goal, as well as the morality of pursuing it. There is also a pressure to conform to the group. Finally, there is also a perception of unanimity that is reinforced by guards within the group. These signs can be observed through the lens of the larger goal of maintaining an international image, in the backdrop of the Cold War. Despite the adverse effects of faulty information dissemination (as seen through the lack of transparency and clear instructions), there was perseverance in this goal. There was, therefore, disregard for the deviant view expressed, which was the suggestion to provide more clarity. The perception of "the other" was dominant; there was a need to negate the view that information about the incident was withheld. Hence, the Soviets gave more information on the international platform than domestically. Thus, the group nature of the decisions made is evident.

Conclusion

These findings point toward behaviours and psychological factors; it is observed how the individuals are bound by rigid norms, rules, and expectations to behave in a way that will achieve the collective goal. It also indicated how the characteristics of a society exert their influence on individuals, as well as organisations and systems of the state. Further, there are also descriptions of how decisions are made, and facts are used to achieve different objectives, and how this concealment is justified with biased thinking and behaviour. According to Shylakhter and Wilson (1992) there were many factors responsible for the accident, but that "human beings are responsible for each of the contributing causes on the list" (p. 253). Hence, applying a social psychological lens to this incident shows the nature of social interaction that created the system, which in turn created Chernobyl. From the decisions made and the social attitudes in place, to the manipulations and projections of the aftermath, Chernobyl is a case of group processes that were deeply

embedded in the institution. It is a study of how a society caused, experienced, and later dealt with one of the greatest tragedies in human history.

Implications, Limitations, and Direction for Future Research

The findings of the present study give an understanding of the psychological factors involved in the functioning of institutions, specifically regarding dealing with disasters and emergencies. Using the case of a historical event, the current study gives a glimpse into how societies and institutions such as governments are reflections of each other, and are subject to group processes. It illustrates how key social psychological concepts like decision making and culture underlie the functions of society and the state, and can be further applied to understand present-day social and governmental activities. The study adds to the understanding of the Chernobyl incident through the perspective of psychological processes that govern social and political behaviour. While previous research explored the causation of the incident in terms of the technical and political aspects, the current study highlights the group processes involved, thereby providing an understanding of political units as social entities, and how individual and group psychology can have far reaching effects through policy and crisis management.

The study, however, does not provide insight into the way the system has changed in almost forty years since the explosion. Further exploration into the measures taken in light of the failures of Chernobyl can be used to evaluate the social change that followed it. It can also have been limited by the number of data sources used.

Further research can be done on the psychology of institutional structures in relation to group dynamics, decision-making, power structures, collectivistic societies, group secrecy, and information flow. The psychology of governments and its link to the societies they serve can also be explored.

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Appendix

Table Showing Themes, Codes, and Verbatim Statements from the Data Set

Themes	Codes	Verbatim
Role of obedience and power dynamics in structures: factors in causes and effects of the incident	Emphasis on the goals of the state	<i>D1: "...the motives requiring the development of the nuclear power industry have not changed... The goal set in the Soviet energy program-to raise the capacity of nuclear power stations by 400 to 600 percent by the end of this century-will not be revised."</i>
	Maintaining international image	<i>D2: "The Chernobyl accident in April apparently has convinced the world nuclear industry that nuclear power is safe-or at any rate safe enough. This somewhat disconcerting conclusion emerged from an August 25-29 conference in Vienna, sponsored by the International Atomic Energy Agency (IAEA). There the Soviet Union presented its official report on the world's worst nuclear accident."</i>
	Rectifying criticisms from Western countries	<i>D2: "By the close of the conference the Western delegations had drastically muted their criticisms of Soviet nuclear technology. The evidence of impressive Soviet competence in other areas-especially the emergency measures implemented in the hours after the accident-had taken the edge off earlier Western suggestions that the Soviets could not be trusted to build and operate nuclear plants."</i>
	Public relations success on an international forum	<i>D2: "...an outpouring of mutual congratulations on the week's efforts. For the Soviets the conference was a public relations triumph. Their forthrightness and candor all but blotted out the memory of the initial Soviet failure to warn their neighbors about Chernobyl."</i>
	Emphasis on the goals of the State	<i>D4: "...he said that they had somewhat messed something up, and an accident of sort had occurred there, but this would not stop the overall development of the atomic energy program."</i>

Emphasis on fixed
roles and respon -
sibilities

Reliance on
established procedure

Reliance on
established procedure

Lack of questioning
among personnel

Separation of the
state and the work of
scientific institutions

A u t o n o m y o f
scientific work

Subordination of
science to the state
No heed paid to
scientific concerns

Emphasis on fixed
roles

D4: "...the institution in which we all worked was built on principles of the highest qualifications of people who were executing any operation with the highest responsibility...highly qualified people who were used to being relied on, and were convinced that safety issues are solved solely by skills and by precisely instructing the personnel that led the process."

D4: "...they began to lose the standard of modern equipment. The staff began to age. Fewer young people joined. New approaches were not welcomed...The habitual rhythm of work persisted and the usual approach to solving problems prevailed."

D4: "...a generation of engineers came up who were very competent, but not critical of the devices themselves, not critical of all the systems that were ensuring their safety; but mainly knew the systems and required an increase in their numbers."

D4: "Our Institute was not part of the Ministry of Medium Machine Building. It stood beside it, as a separate independent organisation, and had the right to dictate its scientific requirements and positions. And the Ministry, after evaluating the scientific proposals, was technically obliged to execute them precisely...Scientific proposals not being limited by the influence of those in power...history came to such a state where science became subordinate to the Ministry...And so, the scientific spirit and the scientific atmosphere in reactor engineering gradually began to submit to the engineering will, as it were, to the ministerial will...it complicated my relationship with the Ministry when I tried to, not very carefully, speak out on this issue. And I could not win in these matters...I was a chemist, and this allowed them to not listen to my opinions carefully and to treat my suggestions as sort of fantasies. This was the general environment in which all this work was happening"

Secrecy, concealment, and manipulation of relevant information

Honour prioritised over safety

D4: "The operators made mistakes because they had to complete the experiment which they considered a matter of honour..."

Contrast between media for Soviet vs. international audiences

D2: "Legasov also brought with him a 25-minute videotape entitled simply "26 April", which was shown to the conference on the opening morning and then twice again by overwhelming demand. The film offered a grim contrast to the Soviet television documentary being shown in the delegates' lounge. The doggedly cheerful documentary devoted most of its time to the efforts of the workers"

Optimistic picture

D3: "It is well known that after the Chernobyl accident, the Soviet government immediately did everything possible to conceal the fact of the accident and its consequences for the population and the environment: it issued "top secret" instructions to classify all data on the accident, especially as regards the health of the affected population."

Concealing facts about consequences on different levels

Restricting access to information

D3: "...instructions from the ministry of health and the ministry of defence to classify the radiation doses received by the general population, the "liquidators... and military personnel. These regulations demanded that medical staff must not enter a diagnosis of "acute radiation syndrome" in the files of liquidators from the armed forces but must substitute some other term."

Dishonesty about radiation effects on people

Manipulation of diagnoses and medical records

D3: "These classified documents were not accessible for many years. Only in 1991, when the Soviet Union was collapsing, was I able to get hold of secret protocols and other documents of the operative group of the Politburo. These minutes revealed the numbers of persons irradiated and hospitalized during the first days after the accident

Restricting access to information

D3: "The cynicism of the document is striking: "The proposal of the Ministry of Health Care of the USSR on publishing data on the number and condition of patients in Moscow Hospital No. 6 should be accepted, taking into account that there are US specialists working in this hospital." Had

Transparency in the face of scrutiny from international actors

Loosening of standards on radiation-related sickness

Americans not been there, nothing would have been known about the situation in Hospital No. 6.”

Manipulation of diagnoses and treatment
Tampering with medical records

D3: “Why did the process of discharging people from hospitals become so rapid after the number of patients had exceeded 10 000?... the 10 000-plus people hospitalized because of exposure to radiation were automatically reclassified as “healthy” and discharged. The official number of people suffering from acute radiation syndrome also fell significantly. It goes without saying that Party bosses increased the acceptable dose in this way simply to hide the numbers affected.”

Political intervention in medical decisions and records

Concealment of facts to hide economic implications

D3: “It had become a matter of economics: the USSR could not afford to resettle so many people. The truth about the health of the population had to be concealed from the population itself.”

Tampering with medical records

D3: “Officials in the Narodichi district of the Zhitomir region made every effort to eliminate the primary medical documents representing the actual doses: medical staff were ordered to register understated dose values.”

Manipulation of medical records

D3: “...secret official documents of the Academy of Medical Sciences of the USSR are similar. According to them, no autopsies of those who died after the accident, including children, were carried out in the SCZ in Zhitomir region

Putting the severity in perspective, relative to other accidents

D1: “...the history of our time knows accidents when human losses were greater by many orders of magnitude. If we regard the Chernobyl breakdown in this respect, it is not the most terrible”

Secrecy, concealment, and manipulation of relevant information

D1: “There are some districts outside the 30-kilometer zone... which are contaminated by strontium and cesium. People live in these districts but they eat foodstuffs brought from other regions. They lead quite a normal life; they are not exposed to any noticeable external radiation, but foodstuffs grown in

	<i>this territory are not recommended for use.”</i>
Mention of normalcy	<i>D1: “...all 200-odd people who have developed radiation sickness have left the hospitals...All-round diagnosis of the general condition of the people is periodically carried out, and the composition of their blood is checked. Particular attention is paid to the thyroids and lungs. To the best of my knowledge, no anomalies have been detected among the evacuees.”</i>
Dealing with the health of first responders	<i>D2: “The press conference panelists-comparing this with fatalities in car accidents, plane crashes, and other modern technological mishaps insisted on the need to keep the health effects of the Chernobyl accident in perspective...The precise numbers, however, could not be predicted with any confidence, nor would it be possible to say that Chernobyl caused any particular cancer.”</i>
Mention of normalcy	<i>D2: “By setting the long-term Chernobyl fatalities against a background of all the other deaths occurring during the same period in the same population, the health effects of the accident could be made to appear unimportant.”</i>
Providing perspective on long term health effects	<i>D3: “...the authors claim that among the population in the SCZs, who were exposed to irradiation every day, there will be less fatal cases of induced cancers than among the population of all other territories.”</i>
Putting the severity in perspective, relative to other events	<i>D4: “Because I reasoned, for example, that if we say this to the people now, the evacuation will be delayed...People will start to pack for too long. That is why I advised...that we cannot tell about the precise duration of the evacuation yet.”</i>
Full picture not given to avoid panic	<i>D1: “Although the consequences of the Chernobyl disaster are very serious-31 people have perished, over 200 persons have acquired radiation sickness”</i>
Admission of seriousness	

Differential dissemination and disclosure of information	Information given in-depth	D2: "Western suspicions that the Soviet authorities would resort to obfuscation and cover-up were swept aside by a deluge of information-explicit, vivid, and chilling. The official Soviet report ran to 388 pages. In a five-hour tour de force the head of the Soviet delegation, Academician Valery Legasov, deputy chairman of the Kurchatov Institute of Atomic Energy, introduced the report."
	Details of incident given	D2: "Legasov's videotape, however, recounted all too starkly the events of April 25-26 that had made all the subsequent heroics and cleanup efforts necessary"
	Transparency about the incident	D2: "No Western advance commentary on the Soviet report had come close to conveying the true horror of the accident."
	Admission of severity	D2: "As to the longer term, many people would suffer cancers as a result of exposure to radiation from Chernobyl, some of which would certainly be fatal." D2: "Legasov had admitted that the RBMK design had not merely disadvantages but defects."
	Transparency about structural flaws	D2: "Their forthrightness and candour all but blotted out the memory of the initial Soviet failure to warn their neighbours about Chernobyl." D4: "There are so many different interpretations of how and why this happened, that it is in a way my duty to tell what I know, how I see and understand it and how I witnessed the events that occurred."
	Honesty about the incident to undo previous lapses in giving information	D4: "There was no understanding of the steps that needed to be taken, neither from station personnel nor from the Ministry of Energy. And so I and the Government Commission had to take these decisions, come up with the action plan, get a clear understanding of the situation"

Transparency about the incident	<i>D4: "During the first days of the Chernobyl tragedy, the flaws in our information services were very evident...that prepared literature that could quickly be distributed among the people to explain, for example, what doses are extremely dangerous for humans, how to behave when a person is inside a zone of increased radiation exposure...all this literature was totally absent."</i>
Uncertainty about the situation	
Lack of instructions to the masses	<i>D4: "I have already mentioned that I had proposed from the beginning to create a press group under the Government Commission that would correctly inform the population about the events that were happening, that would give the right advice. For some reason, this was not accepted"</i>
Legasov's desire for transparency	
No action taken to provide information	<i>D4: "...our press reported a lot of information of the second type, about people, about their impressions, about what was happening there, but reported very little...about what has happened so far and what has changed. This, in my opinion, was a defect in the communication system, firstly. And secondly, there were too few statements by expert scientists."</i>
Lack of credible scientific information	<i>D4: "It seems to me that they were overly modest and careful when writing about what happened at the station itself, why the accident occurred, whose fault it was, whether the reactor was defective or the actions of the staff were wrong... I think that the full picture of exactly what happened, and how, is not entirely clear to anyone."</i>
Incomplete and unclear information about the causes	<i>D4: "The plan for the experiment was drawn up very poorly, very imprecisely, and not authorised by the specialists by whom it should have been authorised...One operator calls another and asks, "Valera, here in the program, it's written what needs to be done, but then a lot of it is crossed out. What should I do?" And the second one answers, "You do what is crossed out.""</i>
Poor planning of the test	
Incomplete instructions given to personnel	<i>D4: "There were a lot of inconsistencies between the part of the documentation that</i>

Flaws in documentation

Lack of transparency
regarding evacuation

was at the station and the reality in various places of the station and underground facilities. All this certainly gave an impression of gross neglect, of gross sloppiness towards maintaining documentation, which should be accurate”

D4: “I understood, I must tell you honestly, that I understood that the city was being evacuated permanently. But psychologically, somehow, I did not have the means, the strength, the ability to say this to people