

Critical infrastructures and responsibility: A conceptual exploration

Koos van der Bruggen ^{*,1}

*Delft University of Technology, Faculty of Technology, Policy and Management, Department of Philosophy, Jaffalaan 5,
2628 BX Delft, The Netherlands*

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Abstract

In this article some considerations are presented as a starting point for judging responsibility for infrastructural systems from a moral point of view. Infrastructural systems are essential for present day high-tech society. Without good working infrastructural systems people would hardly be able to survive. The importance and relevance of good working critical infrastructures for states and other public authorities are illustrated with some examples. Next, the meaning of the concept of responsibility in relation to infrastructural systems is developed. Outcome responsibility and remedial responsibility – developed in philosophy of law and political philosophy – are elaborated as useful concepts for dealing with responsibilities in infrastructural systems. This analysis is applied to the players on the infrastructural field: governments and other public authorities, non-state institutional actors and last but not least individual agents. In a last paragraph some conclusions are drawn, which can be applied for apportioning responsibility for infrastructures in practice.

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1. Introduction

In ethical literature a lot has been written on (moral) responsibility. It certainly is one of the key issues in ethical theory. In this article I will present some considerations that can be a starting point for judging responsibility for infrastructural projects and activities from a moral point of view.

First, attention will be given to infrastructures. What are the so-called critical infrastructures? What is their importance? What is their function in present day society? What place do they have and what place should they have in social and political arrangements?

Next, the meaning of the concept of responsibility regarding the management and operation of critical infrastructures will be further developed. What does responsibility mean in relation to critical infrastructures?

* Present address: Leiden University/Campus The Hague, Lange Houtstraat 5-7, 2511 CV DEN HAAG. Tel.: +31 70 3021070.

E-mail addresses: filosofie@tbn.tudelft.nl, kvanderbruggen@campusdenhaag.nl, k.vanderbruggen@hetnet.nl

¹ Tel.: +31 15 27 85143.

Whose responsibility is at stake? Do all players in the field have the same responsibility? What are the practical or theoretical problems in defining and applying responsibility for infrastructures? Outcome responsibility and remedial responsibility will be elaborated as useful concepts for dealing with responsibilities in infrastructural systems.

A third paragraph will be devoted to the players on the infrastructural field. These are in the first place governments and other public authorities. Furthermore, non-state institutional actors: infrastructural companies and organizations. And last but not least the individual actors in these fields. What are their roles and their responsibilities?

In a last paragraph some conclusions will be drawn, which can be applied for apportioning responsibility for critical infrastructures in practice.

2. Critical infrastructures

Infrastructures can be described as “the basic facilities, services, and installations needed for the functioning of a community or society, such as transportation and communications systems, water and power lines, and public institutions including schools, post offices and prisons” (<http://www.thefreedictionary.com/infrastructure>).

This is a rather broad definition, including schools, prisons, etc. So, the concept is not limited to technical systems alone, but it leaves no doubt that the technical basis is essential for many infrastructural systems. In this article attention will be limited to the so-called critical infrastructures that have a (strong) technical component. The safety and reliability of technical provisions are important if not necessary conditions for the functioning of most infrastructural systems. This implies a special responsibility for the people and the institutions that are in charge of the task to design and apply the technical artefacts that are part of an infrastructural system.

The concept of critical infrastructures has become a key concept in recent discussions. Since a few years there is a Journal for Critical Infrastructures. This journal defines critical infrastructures as “networks for the provision of telecommunication and information services, energy services (electrical power, natural gas, oil and heat), water supply, transportation of people and goods, banking and financial services, government services and emergency services”. (<http://www.inderscience.com/browse/index.php?journalCODE=ijcis>). This is a limitative definition, which covers “infrastructures so vital that their incapacitation or destruction would have a debilitating impact on defense or economic security”, as it is described in a report for the US government (Moteff et al., 2003; *Critical Infrastructures: What Makes an Infrastructure Critical?* Report to Congress).

Western societies have become more and more dependent of these critical infrastructures, but at the same time we are witnessing a paradoxical development (De Bruijne, 2006, p. 11). De Bruijne shows that “on the one hand critical infrastructures are increasingly interconnected into a single system of unimaginable proportions”. But on the other hand these large-scale infrastructures have become institutionally fragmented. There is no longer any single organization (be it public or private) that can compel others to act.

This fragmentation has also occurred within the separate infrastructural sectors, such as telecommunication and energy, where many competitive actors are playing a role. Moreover, these actors are no longer acting within one country, but cross-national: German ICT-operators have taken parts of the market in France, and Dutch railways are active in Poland.

Another development that De Bruijne describes is the interconnectedness of critical infrastructures (De Bruijne, p. 12). The functioning of all infrastructures becomes more and more dependent from ICT-performance and from the electricity system. The threatening slogan of the labour unions for Dutch railways-workers in the beginning of the 20th century is more true than ever before: this whole cogwheels system will fall down if you want it to happen. Nowadays, a simple computer failure can lead to the laming of railway traffic, so safety cannot be guaranteed anymore. This happened more than once in the Netherlands in the past few years.

Disturbances in the ICT-system or in the energy net indeed can lame a society, not only at a national scale but also across borders. Well known examples are the fall-out in great parts of the North-East of the United States and in Canada in August 2003, due to a chain reaction in powerplants. The same happened in parts of Germany, The Netherlands, Belgium, France and even Spain, Portugal and Italy in November 2006. A

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