



TENSIONS OF EUROPE/INVENTING EUROPE

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TITLE: Scientific report of the workshop: *Transnational Infrastructures: Coping with Scarcity and Vulnerability*, Stockholm and Sigtuna, May 21-24, 2008

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KEYWORDS: Transnational infrastructures, critical events, European integration, vulnerability, scarcity, EUROCRIT

Abstract:

This is a report on the second major Eurocrit workshop. Its theme was the increasing risks of scarcity and vulnerability as a consequence of the increasing integration of infrastructures among European nations. An organizing concept was the idea of “critical event,” i.e. mishaps or functional interruptions that may reveal the structural faults in transnational infrastructures. These critical events were studied from a number of perspectives and for different infrastructures and regions in Europe. Most of the conference was devoted to commentary and lively debate on pre-circulated papers. The conference was divided into three thematic parts:

- (1) Critical events in transnational infrastructures – and the responses
- (2) Perceptions of scarcity and vulnerability
- (3) The emergence of critical infrastructures in Europe

There are two appendices. The first is the workshop program. The second is a list of participants. Abstracts and texts of the papers are available as Working Paper 2008-7a.

Scientific report of the workshop: *Transnational Infrastructures: Coping with Scarcity and Vulnerability*, Stockholm and Sigtuna, May 21-24, 2008

Arne Kaijser
Per Högselius

Summary

The purpose of the workshop was to explore how the intertwinement of different infrastructural systems have created interdependencies and new types of vulnerabilities and scarcities. A key concept at the workshop was '*critical events*'. An ambition was to analyze how actors in different countries have acted, both when critical events have happened, and also afterwards so as to prevent similar events from happening again. The ambition was to investigate different parts of Europe, trying to determine the extent to and ways in which the cooperative patterns have looked different, for example, within the former Eastern bloc, on the Balkans and in Western Europe.

The workshop had three parts. The first afternoon consisted of an open seminar at KTH in Stockholm, with four keynote speeches and a subsequent panel debate. The second day and most of the third day took place in the small town Sigtuna and were devoted to discussions of altogether 18 papers. The third evening and fourth morning consisted of an internal meeting of the EUROCRIT CRP, at which we discussed the lessons from the workshop and planned our future work.

All in all 30 researchers participated in the workshop, 16 of which belong to Eurocrit, 4 from other CRPs, 3 from "shadow-CRPs" and 7 others. Our assessment is that the workshop was very productive for the Eurocrit-project. We also believe that the workshop contributed to a cross CRP learning process. We learned about the work and approaches applied in the other CRPs (and two shadow CRPs) and they learned about our approaches.

The final programme of the workshop

The full final programme is provided in attachment 1.

A description of the scientific content and discussion at the workshop

The purpose of the workshop was to explore how the intertwinement of different infrastructural systems – both with each other (vertically) and across political borders (horizontally) – have created interdependencies and new types of vulnerabilities and scarcities. A key concept at the workshop was '*critical events*'. Such events can be of different kinds, for example electricity blackouts, interrupted deliveries of natural gas, airplane crashes, etc. An ambition was to analyze how actors in different countries

have acted, both when critical events have happened, and also afterwards so as to prevent similar events from happening again.

Our ambition was to investigate different parts of Europe, trying to determine the extent to and ways in which the cooperative patterns have looked different, for example, within the former Eastern bloc, on the Balkans and in Western Europe. But we also wanted to explore how 'Europe' as a whole manifests itself in – and how it can be understood through – critical events, processes of standardization, discourses etc. relating to transnational infrastructures.

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The purpose of the open seminar, which was attended by a little more than 50 people, was primarily to invite leading scholars and practitioners to give their views and also discuss the problematique of the workshop. In addition, Arne Kaijser informed the audience of the Inventing Europe programme in general and the EUROCRIT project in particular. Four key-note papers were presented. Two of them were related to critical events that have been very much discussed in Sweden in recent years were presented and discussed: The Estonia disaster and the Tsunami in Asia. Kent Härstedt, a member of the Swedish parliament who is one of the survivors of the Estonia disaster and has engaged himself much in questions related to crisis management, talked about his experience of the Estonia disaster and what can be learnt from it. Dr. Per Molander, a policy analyst who was the main secretary of the Swedish Tsunami Commission, described how the Swedish administration has been changed as a response to the Tsunami in order to be better prepared for future critical events. The two other key-note papers were given by academics. Professor David Nye talked of the social responses to large black-outs in the US that have consisted both of spontaneous cooperation and help in a difficult situation, but also of looting and crime. Professor Sverker Sörlin discussed spatial features of risk and how entire landscapes have been transformed as a consequence of vulnerable infrastructures. In the subsequent panel debate these issues were further explored. The key-note papers played a role also during the following days and were referred to in subsequent discussions.

The main part of the workshop was the discussion of papers. The workshop had an ambitious format. With only one exception, all papers had been distributed beforehand (by way of the Eurocrit homepage) to the workshop participants, and the participants had read them when they came to the workshop. This made it possible to have very focussed and intense sessions. The papers were divided into three themes:

- (4) Critical events in transnational infrastructures – and the responses
- (5) Perceptions of scarcity and vulnerability
- (6) The emergence of critical infrastructures in Europe

In order to facilitate cross-fertilization of contributions and to encourage the search for common points, the papers were further grouped into 'pairs'. A commentator was

assigned to each pair of papers and a final commentator to each theme. Each pair of papers was introduced in brief (5-10 minutes) by the commentator, whose task was to summarize the main points in the contributions and suggest issues for discussion and in particular issues that cut across each pair of papers. We also had three summing sessions, one for each theme, at which we tried to identify commonalities and differences among the papers in a theme.

The atmosphere at the workshop was very productive. The participants had prepared themselves well in advance and the discussions during the sessions were lively and constructive. Also the discussions in between the sessions and during the meals were very productive.

It is very difficult to summarize all the discussions but here follows a short account of the discussions, focusing on some conceptual, methodological and empirical issues that were raised in relation to the overall Eurocrit and, more generally, Inventing Europe research agendas.

A focusing device for the workshop, as decided upon beforehand, was the notion of '*critical event*', and this was also the overarching theme for one of the three sessions of the workshop. Erik van der Vleuten and Vincent Lagendijk had in their paper on electricity blackouts suggested a double interpretation of the concept: on the one hand, a critical event can be studied as a problematic incident provoking a management response, making it instrumental to further system development. This perspective would aim at various events in the history of an infrastructure. On the other hand, a critical event can be studied as an extraordinary occurrence where things become visible that are usually not. With this perspective it can be fruitful to take an event in the present (rather than in history) as a starting point for analyzing the history of the infrastructure.

Anna Åberg in her paper on natural gas relations between Sweden and Denmark, suggested the possibility to regard the long-term fall in oil prices during the first half of the 1980s as a critical event in the evolution of natural gas infrastructures. Per Högselius in this connection suggested a possible distinction between '*critical events*', as sudden events that lead to breakdown in infrastructures, and '*critical trends*', as more long-term developments that prove crucial for the further evolutionary paths of transnational infrastructures. An alternative definition proposed by Eda Kranakis for critical events was '*events which produce long-term structural change*'. The workshop participants seemed to agree that the notion of critical event is fruitful both as a theoretical concept in its own right and as a heuristic device for studying critical infrastructures.

It was also noted that critical events may not by definition necessarily be regarded as something negative by involved actors. They may also be positive, for example in the way in which critical events become the starting points for creative renewal. The empirical material from the workshop clearly points in this direction, in that critical events and other system failures have, with hindsight, often turned out to be positive turning points, leading to improvements and increasing long-term safety and reliability. An interesting development in this respect is also the natural gas relations between East and West, as elaborated by Per Högselius, which started on a very modest scale and without any critical importance, but which have gradually increased

enormously in volumes and importance following the perceived reliability of the arrangements. Systems which in this way grow and work seemingly without any critical events may here create a false perception of safety. In other words, it may be a danger when systems are working without critical events for a long time. David Nye in his keynote address emphasized the seemingly paradoxical experience, in historical perspective, that ‘the more efficient a system is working, the more destructive is an accident’.

The concept of ‘*flow*’ figured in many ways in the workshop discussions. David Nye, in his commentary on the first session, noted that critical events can often be interpreted as disturbances in various flows, a theme that was followed up in the ensuing discussion. In the case of flows of water, of electricity and information a common threat is the risk of *overflow*. In electricity and information this may in turn lead to the *interruption* of flows. This was illustrated by the case of electricity blackouts but also in the case of emergency systems as pointed out in the keynote address by Per Molander concerning overload of telephone lines to the Swedish government’s crisis centre following the tsunami in Asia in 2004. The issue of overflows might be contrasted to the problem of scarcity as faced in the natural gas industry in transportation infrastructures, where the risk is rather a direct interruption of flows, either through accidents or through a deliberate action by the sending party. As a methodological approach, Erik van der Vleuten raised the opportunity of studying plans determining which users of an infrastructure will – and will not – be cut off from the flows in case of acute shortage. Promising empirical fields may here be electricity and natural gas, and material for such a study may be found in national defence plans.

As illustrated by Eda Kranakis paper on airplane hijacking, a related risk is the *diversion* of flows into unwanted directions. In broadcasting, as illustrated in the paper by Andreas Fickers, there is the risk of *competing* flows interfering with each other and destroying the meaning of messages. Infrastructures are create for *intended* flows, but there are also *unintended* flows such as the spread of computer viruses and physical epidemics which are caused by the smooth functioning of global infrastructures. In other words, as agreed by the workshop participants, circulation is not always positive.

In the Eurocrit application one important research question is what type of *responses* actors have developed over the years to critical events. Eda Kranakis’ paper was from this perspective an interesting study of how the emphasis in policy response measures seems to have shifted from a focus on institutional, legal measures to more technology-based approaches. David Nye made an important contribution to another issue of central importance to the Eurocrit research agenda, namely the *social* response to disasters and other critical events. In his study of American blackouts in different years, he concluded that the social responses by the people affected have varied remarkably, but that there is no clear trend. He argued that the social response is not a function of the characteristics of the infrastructure itself, but rather of the cultural factors such as the time spirit.

Linking up with a central political issue in infrastructure policy of our own era, the workshop also discussed *deregulation and liberalization* in infrastructure sectors. Deregulation was discussed particularly in relation to the increasing complexity of

infrastructures, not least following the far-reaching cybernetization of systems. This relates directly to both Eurocrit study of ‘vertical integration’ and the EU-SOFT project on European software: here the workshop produced an interesting discussion about how the need for simple interfaces – which can be regarded as simulations of simplicity – drive actors to develop more complex systems. In Lars Thue’s words, ‘complexity creates an image of simplicity’. Thue argued that it is a problem that many actors – not least end consumers – are not aware of the enormous complexity of today’s infrastructures. In a similar line of thought, Gerard Alberts described the perceived need to turn complexity into simplicity in order to persuade users about the viability of complex systems.

Transnational infrastructures, the workshop noted, play an important part in the *geopolitical struggle* – not least in Europe during the cold war, in which the emergence and governance of critical infrastructures has to a large extent been embedded. But, as in the case of natural gas relations, critical infrastructures may also present a counter-perspective on the usual image of the East-West divide. They may also help to shed light on the difficult relations with the United States. Infrastructural integration between East and West has sometimes functioned as a way to balance the dominance of the United States on the political and economic life in Europe. Some countries offer peculiar perspectives that add to the overall picture, notably Finland, which in the workshop was emphasized as a gateway between East and West, with a considerable dependence on the Soviet Union, but with an ability to successfully find a way to profit from infrastructural integration with its neighbouring superpower. All in all, it seems that technological systems push their way across the East-West division. Eda Kranakis, commenting on Per Högselius’ paper on natural gas relations, suggested the notion of the ‘variable Iron Curtain’ and proposed that this can be further developed within Eurocrit. She also noted that the build-up of East-West infrastructures have been accompanied by a flow of technology from the West to the East, for example in the form of gas pipeline equipment.

However, as emphasized by Thomas Kaiserfeld in his commentary, workshop papers seem to suggest that there are ‘*borders of technological distrust*’. Moreover, since the collapse of communism, these borders of distrust now seem to be moving eastwards, but not disappear. Kaiserfeld further noted that most workshop papers are characterized by an absence of ideological discussions, which he argued is a weakness. It would add to the research agenda of Eurocrit to put some more emphasis on issues related to ideology, and how infrastructures may change ideology.

The issue of *changing borders* and how this relates to the evolution of critical infrastructures was also discussed. As pointed out by Sverker Sörlin in the panel debate, when infrastructures grow old they tend to ‘escape responsibilities from the past. Hence a country which once built an infrastructure may as a consequence of new borders lose both control and responsibility of the infrastructure. Examples from the workshop included Per Högselius’ study of natural gas relations in Eastern Europe, where an old Polish gas system became a transnational Soviet-Polish system after World War II and a Ukrainian-Polish system after the collapse of the Soviet Union, as well as Nil Disco’s study of critical events in the Rhine in 1809 – at a time when ‘Germany’ did not yet exist – and in 1995, when the political map looked completely different. Examples from Greece, in addition, shed light on the problem of

missing infrastructure construction in areas of contested borders, such as between Greece and Turkey, and growing vulnerabilities as a result.

An assessment of the results and impact of the workshop on Inventing Europe

Our assessment is that the workshop was very productive for the Eurocrit-project. We organized a workshop in November 2007 in Utrecht where we discuss concepts and theoretical perspectives but without any empirical cases as basis for the discussions. This time we had a large number of papers with interesting empirical cases which gave the discussions more substance. Moreover, the previous workshop was an internal workshop for the Eurocrit project, while this one also included many “outsiders”, four from other Inventing Europe projects, three from “shadow projects” and seven total outsiders. The input from these outsiders was very valuable, both through the papers they presented and through their comments and remarks on papers from our CRP. Hopefully our comments on their papers also was helpful for them. We composed the program in such a way that “outsiders” mostly commented on Eurocrit papers and viceversa.

We also believe that the workshop contributed to a cross CRP learning process. We learned about the work and approaches applied in the other CRPs (and two shadow CRPs) and they learned about our approaches. We had invited researchers from other CRPs that we believed would have research topics that relate to our topics, and this turned out to be the case. A workshop of this format also gives the chance to get to form personal relations across different CRPs that can be important for future cooperation.

Full list of speakers and participants

The full list of speakers and participants is in attachment 2.

Appendix 1

Final Programme of the workshop

Wednesday, 21 May 2008

Location: KTH, Division of History of Science and Technology (address: Teknikringen 76), Room V2

- 13.00 Welcome and EUROCRIT project presentation, Professor Arne Kaijser, Royal Institute of Technology, Sweden.
- 13.30 The social response to electrical blackouts, Professor David Nye, University of Southern Denmark
- 14.00 Vulnerability in practice I: The case of the 'Estonia' disaster in the Baltic Sea, 1994, Kent Härstedt, Member of the Swedish Riksdag

14.30	Coffee
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- 14.00 Vulnerable landscapes: Historicizing spatial features of risk, Professor Sverker Sörlin, Royal Institute of Technology, Sweden
- 15.30 Vulnerability in practice II: The case of the Tsunami disaster in Asia, 2004, Dr. Per Molander, Main Secretary of the Swedish Tsunami Commission
- 16.00 Linking theory, practice and history – a panel discussion moderated by Professor Eda Kranakis, University of Ottawa, Canada

Panelists: Anique Hommels (University of Maastricht, the Netherlands), Petter Wulff (Swedish Defence Research Agency), Lars Thue (Norwegian School of Management), Per Molander and Sverker Sörlin.

17.00	Reception at Division of History of Science and Technology, KTH
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19.30 Bus transfer to Sigtuna, 40 km north of Stockholm

Thursday, 22 May 2008

Location: Sigtunastiftelsen (address: Manfred Björkquists Allé 2-4, Sigtuna)

Session 1: Critical events in transnational infrastructures – and the responses

- 09.00 Transnational Energy Flows and Blackout Risks in a Balkan European Context (Yiannis Garyfallos, Stathis Arapostathis & Aristotle Tympas)

From reliability to liability? Europe's interconnected electricity network
(Vincent Lagendijk & Erik van der Vleuten)

Commentator: Nil Disco

10.00 Coffee

10.30 Eurocontrol: Facilitating Transnational Air Transportation in Europe, 1960-1981 (Lars Heide)

Security in the "space of flows": The problem of air-hijacking in Europe, 1945-1980 (Eda Kranakis)

Commentator: Anique Hommels

11.30 Negotiating scarcity: The natural gas contracts between Sweden and Denmark (Anna Åberg)

"If it keeps on rainin' the levee's gonna break". Drainage systems as critical infrastructures (Nil Disco)

Commentator: Andreas Kunz

12.30 Lunch

13.30 Depths of vulnerability: The interplay between national and international telecommunications in the Express Samina tragedy in the Aegean Sea (Katerina Vlantoni & Aristotelis Tympas)

Emergency services: Two case studies of transnational collaboration between the Netherlands, Germany and Belgium (Anique Hommels & Eefje Cleophas)

Commentator: Gerard Alberts

14.30 Summing up session 1
Introduction: David Nye

15.15 Coffee

Session 2: Perceptions of scarcity and vulnerability

15.45 The cultural construction of criticality: the case of Soviet-designed nuclear power in Finland (Kalle Michelsen)

Nuclear electricity networks in Eastern Europe: Political, social and technological development. The case of the Bulgarian nuclear programme, 1957-1986 (Ivaylo Hristov)

Commentator: Thomas P. Hughes

16.45 Vulnerability, criticality and border: a comparative review of English, Finnish and Russian concepts used in studies of infrastructures (Tuija Mikkonen)

Blackouts in cultural perspective (David Nye)

Commentator: Andreas Fickers

19.00 Dinner

Friday 23 May

Location: Sigtunastiftelsen (address: Manfred Björkquists Allé 2-4, Sigtuna)

09.00 Summing up session 2
Introduction: Thomas Kaiserfeld

Session 3: The emergence of critical infrastructures in Europe

09.45 From Large Technical Systems to Technological Complexes: The case of the electric power industry (Lars Thue)

The Criticality of the Software Crisis (Gerard Alberts)

Commentator: Aristotle Tympas

10.45 Coffee

11.15 Critical nodes in the European transport infrastructure (Andreas Kunz)
Building the Norwegian cold-chain. Controlling diversity (Terje Finstad)

Commentator: Erik van der Vleuten

12.15 Lunch

13.15 Broadcasting as a critical European infrastructure (Andreas Fickers)
Trusting the enemy: Natural gas relations in Cold War Europe (Per Högselius)

Commentator: Eda Kranakis

14.15 Summing up session 3
Introduction: Thomas P. Hughes

14.45 Final discussion

- General conclusions?
- Representatives of other Inventing Europe CRPs comment on possible links and possible points for future collaboration with EUROCRIT

Moderator: Arne Kaijser

15.30 End of open workshop

16.00 Team building activities for Eurocrit partners

19.00 Dinner

20.00 Informal group discussions

Saturday 24 May

Location: Sigtuna

9.00 The 7 IPs and APs report on their progress and problems

Group work: What lessons from open workshop are to be incorporated into EUROCRIT research agenda?

Planning

- Future workshops: Lisbon meeting, collaboration with other CRPs etc.
- Project website

12.30 End of workshop

12.30 Lunch

Appendix 2

List of participants

EUROCRIT Partners

Arne Kaijser, Royal Institute of Technology
Per Högselius, Royal Institute of Technology
Anna Åberg, Royal Institute of Technology
Erik van der Vleuten, Technical University of Eindhoven
Vincent Lagendijk, Technical University of Eindhoven
Karl-Erik Michelsen, Lappeenranta University of Technology
Tuija Mikkonen, Lappeenranta University of Technology
Lars Thue, Norwegian School of Management
Lars Heide, Copenhagen Business School
Anique Hommels, University of Maastricht
Eefje Cleophas, University of Maastricht

EUROCRIT Associated Partners

Aristotle Tympas, National and Kapodistrian University, Athens
Stathis Arapostathis, University of Leeds
Yannis Garyfallos, National and Kapodistrian University, Athens
Katerina Vlantoní, National and Kapodistrian University, Athens
Ivaylo Hristov, Bulgarian Academy of Sciences

Inventing Europe Partners

Gerard Alberts, University of Amsterdam
Terje Finstad, Norwegian University of Science and Technology
Thomas Kaiserfeld, Royal Institute of Technology
Andreas Kunz, University of Mainz

External experts

Nil Disco, University of Twente,
Andreas Fickers, University of Maastricht
Eda Kranakis, University of Ottawa
Thomas P. Hughes, University of Pennsylvania
Sverker Sörlin, Royal Institute of Technology (Wednesday only)
David Nye, University of Southern Denmark
Per Molander, Main Secretary of the Swedish Tsunami Commission (Wednesday)
Kent Härstedt, Swedish Parliament (Wednesday)

Young scholars

Björn Berglund, Royal Institute of Technology
Jiří Janáč, Prague University/, Technical University of Eindhoven

