

Working better together: the new challenges of subcontracting and regulator-regulatee relationship, lessons learned from other industries

René Amalberti, director FONCSI*, France.

Jesús Villena, ICSI-FONCSI, Spain.

Eric Marsden, FONCSI, France

**ICSI-FONCSI 6 allée Emile Monso, BP34038, Toulouse, 31029, France*

1- General context

The FONCSI, a French public-interest research foundation, operates as an international think tank on matters related to industrial safety, human & organisational factors, and safety governance of high-hazard industries.

Our major partners are operating companies and safety authorities in high-hazard industry sectors including railways, nuclear power, aviation, building and construction and oil and gas. We also interact with the healthcare and finance sectors. Our scientific work plan is organized around in-depth “strategic analyses”, each of which lasts 2 years. During these two-year strategic analyses, we undertake a literature review, hearings with industry/regulatory stakeholders, organize a by-invitation academic seminar and a stakeholder dissemination workshop. We have already undertaken a number of these analyses, with outputs published in an open access collection of books managed by Springer, the *SpringerBriefs in Safety Management*.

We propose in this paper a summary of some lessons learned from both sectoral specificities and cross-sectoral benchmarking in our two last strategic analyses, on the ‘evolution of outsourcing’ and on the ‘regulator-regulatee relationship in high-hazard industries’, and briefly discuss their applicability to the railway sector. These subjects are evolving quickly due to the digital revolution and to the changes occurring in industrial organisation due to financialisation and globalisation. These two trends question the classical methods of safety assurance and induce a cascade of new questions on the model of control (how far can deregulation go) as well as issues of mutual responsibility and liability. We also see an increasing role of third parties in the social control of high-hazard industrial activities, which raises questions related to responsibility and to public acceptability.

2- Two lessons learned from the strategic analysis on ‘the evolution of outsourcing

The past decades have seen a move from large, vertically integrated firms, to production organised around a supply chain with outsourcing and contracting. Large companies increasingly purchase components from third parties instead of producing them themselves, and purchase services from outside suppliers rather than employing staff for activities that are not central to their strategies. These evolutions have been driven by several megatrends, including financialisation of the economy, globalisation, and the rise of more powerful communication technologies and information infrastructures. They are also driven, in some segments of the economy, by the increasing importance of specialized skills and knowledge in certain business activities, and the recognition that it is more effective to collaborate with

specialized partners in the context of a network or alliance, rather than attempt to maintain the broad array of expertise internally.

2.1 Lesson 1: Not one but many outsourcing categories with different safety concerns

There is not a single type of subcontracting, but several accumulated since the 1960s. These types exist in parallel within companies and raise different problems. We distinguish 3 categories. Two are traditional, while the third is relatively new and rapidly pervasive, in link with the new trends of globalisation, destructurement and financialisation. In the context of traditional types of subcontracting, the question of the contract and power asymmetries is central for safety between lead firms and smaller ones in diverse industries across and within countries. In contrast, concerns are slightly different for the last category of outsourcing and will be discussed below in the second lesson.

There are historically three generic reasons for outsourcing activities, which translate into as many categories of subcontracting: subcontracting to reduce costs, outsourcing to obtain flexibility when faced with fluctuating demand, and subcontracting to benefit from outside expertise that is not available internally. To these three main categories are now added an internal-external dimension to the company, with the new forms of “internal contracting” which use market-like mechanisms even for work carried out internally or within a subsidiary. In the two first historical categories of outsourcing mentioned above, the analysis highlighted concerns associated with contracting some activities in international contexts, in countries in which the cultural approach to safety is different.

Another concern relates to projects relying on multiple subcontracted companies which must share information and safety procedures as if they were part of the same organisation. This requires trust in relationships, including the ability to speak up. They emphasise the difficulty of creating this successful environment because of the effects of contractual arrangements. Contracts indeed imply a power asymmetry between client and contractor which might impede their ability to express their opinions or views in conflicting situations.

Regarding safety, there is an established literature in this domain which correlates contracting (in particular with multiple levels of subcontracting) with degraded occupational (health and) safety conditions. Two broad contexts can be distinguished. The first one is the exploitation by lead firms of opportunities to offshore manufacturing in poorly regulated, low-wage geographic areas (e.g. the Rana Plaza disaster in 2013 in Bangladesh in the fast fashion industry). Fortunately, the expected benefits of such outsourcing are now balanced by the risks of reputational consequences for the payers. The second context describes a similar pattern, although less pronounced, in developed countries where focal firms tend to outsource work that is inherently more exposed to health and safety risks, such as maintenance and construction. Our occupational safety legislation and public policies don't account for the fact that more and more of this work, once undertaken by larger business organisations, is being undertaken in this subcontracted kind of manner. As noted by Weil (2014), the more subcontracting, the more “fissuring” of the work, the greater the risk for health and safety at the bottom of those chains.

Of course, it is impossible to generalise, and the diversity of situations must be acknowledged, some being more virtuous than others, depending on the sector and the companies involved.

However, the business structure relying on externalising work in asymmetric contexts can be unfavourable if strong legal requirements are not in place.

2.2 Lesson 2: outsourcing in networks of networks : the importance of common standards, and of the reduction of fragmentation and excessive bureaucratisation

The third category of outsourcing has rapidly grown with the development of global value chains and global production networks (GPNs), which characterise the new networked configuration of many companies today and are one of the most visible economic consequences of globalisation.

The issues of contract, of trust, of shared standards, of compliance, of international context, of culture, of boundaries, of power and of relationships play a key role in the link between contracting and safety in these GPNs.

In this complex new landscape of the past two to three decades, GPNs in the automobile, food, clothing, service, logistics, transportation, and extractive industries present different configurations, but many companies in these sectors play leading or intermediary roles in a 'network of networks' (Dicken, 2015). For multinationals, these 'networks of networks' mean regular adaptation of their organisational structure and processes in a world of shifting opportunities and threats. One way of adapting is to organise their operations by creating business units (BU) operating in different geographic areas. The range of operational, administrative and legal degree of autonomy of this BU in relation to headquarters varies across industries and companies. But these evolutions of businesses in the context of globalisation also reflect the liberalisation of finance and its subsequent growing power and influence in firms' strategic decision-making.

Another consequence of globalisation, including subcontracting, outsourcing and offshoring, is the increasing importance of new standards that allow collaboration despite increasing organisational complexity. Moreover, deregulation and privatisation of different sectors (telecoms, transport, energy) in many countries have led to a breaking down of the old monopolistic state organisations, with the intent to favour consumers. These are now shared with private organisations, producing a networked — also sometimes described as fragmented — configuration. The end of this monopolistic era of core infrastructure has also led to new roles for state agencies in charge of supervising the tendering process and overseeing the companies making up this network, in areas such as price, quality of service but also safety. To this picture, one needs to add the growing importance of consulting, and the role it has been increasingly playing in areas such as legal, financial, engineering, IT, environment and safety (see lesson 4).

As mentioned by Le Coze (2020), the new complexity cascades into new standards, auditing, paperwork, legal and commercial contracts, which themselves cascade into monitoring processes and more paperwork, etc. This inflation of procedures, standards and bureaucratisation for industry as well as for authorities is one high risk characteristic of current practices in safety which derives partly from these networked properties of businesses, making effective supervision and control more difficult (Hood, 2011).

3- Three lessons from the strategic analysis on the 'regulator-regulatee relationship in high-hazard industries'

3.1 Lesson 3: the Framework for Rule Design in the digital area: more delegation and macro-ends regulation

The varied nomenclature used to describe rule designs can be simplified into four categories based on two dimensions of rule design: means versus ends, and micro versus macro. Complexity and globalisation create conditions for an historical push to adopt more macro regulations, and delegate more to industries. The digital revolution is a significant component of this added complexity.

The social control of high-hazard industry has historically been based on a “command-and-control” approach, in which the safety authority prescribes specific technical and technological requirements that the industry must implement. This approach suffers from a number of drawbacks in the relationship between regulator and regulated entities and the resulting level of safety, already pointed out by (Wilpert 2008):

- It leads to bureaucratisation and regulatory inflation, which increases the cost of compliance while often promoting unreflective compliance with rules, reducing the ability of front-line workers to develop their professional responsibility, learn from experience and develop innovative approaches to control risks.
- It does not help build confidence between regulator and regulatee, but on the contrary increases distrust and intrusion of the regulator in operational activities.
- Decisions concerning safety are not made by the people with the most expertise and day-to-day experience of the risks and any emerging problems. This problem is particularly relevant given the increasing use of complex digital tools in high-hazard industry sectors, whose “black box” and highly technical nature make it difficult for the regulator to obtain, independently of the component designer, a high level of confidence in the safety of a system where they play a critical role.

Over time, regulators in different industries have developed other regulatory mechanisms that help avoid some of these drawbacks. These different approaches to rule design have been classified by (Coglianese 2017) along two dimensions: (1) whether the rules target means (specific actions or types of equipment) or target ends (mandating specific outcomes or outputs from the regulated entities), and (2) whether their point of focus in the causal chain from front-line activities to problems that society tries to avoid is micro-focused, addressing a “specific contributor or causal pathway to the ultimate problem” or macro-focussed, addressing the “ultimate problem itself” (Nat’l Acad Sciences 2018). This categorization is summarized in Table 1 (from Coglianese 2017).

Table 1: Rule Designs

	Means	Ends
Micro	<i>Micro-means rules</i> (“Prescriptive regulation”)	<i>Micro-ends rules</i> (“Performance-based regulation”)
Macro	<i>Macro-means rules</i> (“Management-based regulation”)	<i>Macro-ends rules</i> (“General duty clauses”)

These rules designs, components of a “regulatory regime”, each have advantages and disadvantages which depend on the type of risk addressed, the level of maturity of the industry operators managing the risks, and the historical evolution of the relationship between regulator and regulated entities. Ultimately, the critical challenge for safety authorities is choosing the right regulatory tool and understanding which one to use in a particular context. Such decisions call for assessments of advantages and disadvantages in specific contexts, using various analytic tools, such as risk assessment and benefit-cost analysis.

In many cases, the final regulation is a mix of the four categories but with a clear tendency to use more macro-focussed tools. To illustrate this global macro trend, we analysed the impact of new digital tools on the regulator-regulatee relationship and identified three major concerns (1) the growing opacity of advanced digital systems (such as “black box” neural networks) which question the certification processes (and the measure of risk), as well as raising questions as to who will be responsible for failure at end, the supplier of the software component or the system integrator, (2) a growing problem for safety authorities with a possible lack of advanced digital competences in their own staff, and (3) a series of questions about the poverty of established standards in this rapidly evolving digital context, giving rise to a flourishing of local standards, including the ones for safety demonstration of these new digital systems.

3.2 Lesson 4: delegation to third parties is growing

Regulatory systems tend to include a growing variety of third party intermediaries (insurers, notified bodies, auditors, industry associations), performing a variety of roles (Black 2008), with variable capacities, motivations, strategic position and authority. The delegation of responsibility to these third parties can be a benefit to the regulator, expanding its capacity, but can also produce unintended consequences and raises significant questions concerning legitimacy and public acceptability.

In the classical approach to safety oversight of high-hazard industrial activities, the tasks of establishing the legislative framework and regulatory requirements and ensuring that companies comply with the requirements are carried out by state bodies or supranational entities (legislature, government departments, safety authority, inspectorate, etc.). Recent decades have seen the rise of the concept of *governance*, or “governing mechanisms which do not rest on recourse to the authority and sanctions of government” (Stoker 1998), in which the boundaries between public and private responsibilities and sources of authority are blurred.

In some industry sectors, the safety authority or regulator delegates some aspects of its authority to industry or to other third parties. Different aspects of regulatory authority may be delegated:

- Writing standards, regulations and legislation (“rulemaking” or “standards setting” activities);
- Monitoring compliance with the regulations, for example by undertaking periodic inspections or by measuring the levels of pollution emitted;

- Enforcing compliance, for example using fines or other penalties when a duty-holder is not compliant.

The most common aspect to be delegated is the monitoring of compliance, though some institutional situations also lead to the delegation of rulemaking.

Examples of situations where a safety authority has delegated some authority towards the regulated industry or a third party include (1) the *Organization Designation Authorization* mechanism used by the US FAA, which allows aircraft designers/manufacturers to make certain “routine” certification decisions themselves, subject to oversight by the regulator (a mechanism which has seen significant amounts of criticism following the Boeing 737 Max disasters in 2018 and 2019); (2) the inspection of pressure vessels by approved staff from an industrial operator, rather than by government inspectors; (3) the auditing of safety cases of industrial facilities in Spain concerned by the Seveso regulations by private firms called Conformity Assessment Bodies, rather than by a public inspectorate; (4) the validation of seaworthiness of ships by private classification societies, working on behalf of flag states.

This partial delegation of authority raises questions concerning the management of conflicts between commercial considerations and safety when decisions are made by a private entity that has incentives to reduce the stringency of its controls, the effectiveness of the resulting safety controls, and the public acceptability of delegation to organisations that have no strong democratic mandate or accountability to the public.

3.3 Lessons 5: Sharing information between regulators and regulatees: a huge variation among industries and countries

Regulators are faced with a well-known dilemma: effective control of risks requires expertise and information on real activities, which requires them to be “socially close” to the regulated industry, but this “togetherness” risks affecting their independence. Different industries and national arrangements have adopted varying approaches to this dilemma.

How socially close or distant should regulators and regulatees be in high-hazard industries? Closeness and high interdependence between regulators and regulatees can enable regulators to overcome otherwise disabling information asymmetry and draw on the technical and operational expertise of the regulatees, while the latter can rely on regulators to provide them with formal and informal authorisation for their continued ‘social licence’ to operate (Baldwin, Case and Lodge, 2011). These tradeoffs are approached differently depending on the national culture and the industry sector.

For example, the successful use of dialogue as a regulatory strategy in the Norwegian oil industry (Forseth, 2021) is closely associated with Northern European culture and is unlikely to be as effective in southern European countries. Another extreme example comes from healthcare. Healthcare is typical of a complex adaptive system (Braithwaite, 2017). Features of such systems include multiple stakeholders (individuals, organisations, institutions) interacting over time, following rules some of which are self-directed, others which are formally enacted, and yet others which are regulated. The trend to fragmentation of information among stakeholders is a permanent threat which requires considerable efforts.

Digital tools offer possibilities for improvement in these complex systems by automatically gathering and transmitting key information to all parties.

4- To what extent are these lessons relevant to the rail industry?

Railways have long been limited to operations under their national banners, operated by national companies, and controlled by national authorities. This time is definitively over. There is a continuous commercial push to open borders, consider wider operations, privatize and open up to market competition the access to the national railways. The number of railways actors grows in parallel as well as the commercial ambition, and the inherent complexity of networks of partners, suppliers, and subcontractors. In this context, particularly relevant for EU countries, all the problems and solutions reported above sound relevant.

In closing, the national railways systems are entering into an unprecedented period of transformation, with a specific challenge for safety which is only supposed to go one way: always better. This is clearly a challenge which will require both timely quick fixes and in-depth organisational changes.

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