

Gabriele Pinna

**Pierre Fournier, "Travailler dans le Nucléaire. Enquête au cur d'un Site à Risques". Paris: Armand Colin, 2012, 232 pp.**

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## Book reviews

**Pierre Fournier, *Travailler dans le Nucléaire. Enquête au cœur d'un Site à Risques*. Paris: Armand Colin, 2012, 232 pp.**

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Pierre Fournier's book relies on extended field research carried out at Marcoule, one of the oldest and biggest nuclear plants in France. Now, as the future of the nuclear industry is being hotly debated in the aftermath of the Fukushima catastrophe, this work gives us insight into the daily life of nuclear plant workers devoid of sensationalism – particularly workers operating in the plant's maintenance department.

In chapter I, Fournier exposes the limits of a managerial discourse which reductively attributes safety-related incidents to rule transgression by the employees. To demonstrate his case, he provides a detailed account of a sequence of interactions which result in the minor contamination of a worker. This incident occurred during construction work on pipes in a pilot installation intended to develop chemical treatment techniques for used nuclear fuel. Fournier points out that managers' tendency to look for some hypothetical individual mistake fails to give a complete and accurate depiction of the chain of events that lead to the incident. He argues that focusing on the logic of social relations within the work group allows us to develop a concept of collective responsibility in the face of partially controllable risks that is more explanatorily powerful.

Chapter 2 focuses on the training conditions of the nuclear plant workers. The training program occurs in two stages: it begins with an initiation course on the nuclear site, and then continues with peer on-the-job training in the early phases of the work experience. This training is essential for work in the most dangerous, limited-access areas – the so-called “red zones” – which requires wearing special protective gear. In these “red zones,” employees cannot breathe the air or expose their skin to radioactive particles; hence, they have to wear uniforms made of several layers of fabric and vinyl, gloves, boot covers and facial masks. An intervention in the “red” zone is called a “dive” in the workers' lingo. This protective gear is heavy and hot, causing workers to perspire profusely during physical exertion. As with other parts of the training, the practical skills necessary to protect the nuclear worker are transmitted through informal, peer tutoring within the team during the first “dives.” This learning process does not require a lot of talking; it rather occurs through silent imitation. In this chapter, Fournier describes in detail a maintenance intervention of two vehicles located in the “red zone,” underlining the fact that “dives” are not a normal part of the daily work routine. Therefore, these operations are carefully prepared in order to avoid any risk and to minimize intervention time. Fournier argues that the preparations, which foster a spirit of collective mobilization, are carried out with a large degree of autonomy vis-à-vis the managerial hierarchy. Another characteristic of maintenance work is that subcontractors are assigned to the hardest jobs. Upward mobility, then, for maintenance workers is associated with distance from red zone intervention tasks.

Chapter 3 is dedicated to the analysis of a marginal work context: interventions in areas with high levels of radioactivity. Under these exceptional circumstances, interventions cannot be totally structured by strict procedures and routines but require workers'

“practical sense” as well. In this context, workers tend to display a nonchalant attitude, relying on their experience to deal with the unpredictable situations they encountered. This attitude can lead to safety incidents: the case study on which the chapter is based details three cases of workers contaminated after operating machines in these areas. Confidence in their experience may have led the latter to underestimate the risks. Since contamination is an issue that threatens one’s professional image, workers may seek to conceal it. In the case study, exposed workers’ attempted to get disinfected without the help of medical services. This is the reason why work exposing one to radiation is negatively perceived by the workers, who try to evade it or to pass it off to others as “dirty work.” At the same time, employees who “dive” present a playful spirit that accords with their identity as trail-blazers. Fournier points out that social images are crucial in this work environment and professional honor plays a significant role. After the contamination incident, the workers’ confidence was weakened and the negotiated order amongst themselves destabilized. The social actors attempt to restore confidence through subsequent interactions: trying to understand the reasons for the accident, running rigorous control checks on the machines, and continuing to take part in interventions in the restricted area to prove they have not lost their ability to operate.

Chapter 4 reflects on the history of work collectives in the nuclear plant. From a technical point of view, maintenance work in high-radiation areas is simple. More advanced technical skills are required outside of “red zones,” upstream, during the intervention preparation phase. Radioactive hazards present in “red zones” require diagnosis of issues at a distance. These diagnostics require the use of complex instruments and skills working with diagrams and blueprints. As well, maintenance workers engage in contingency planning prior to leaving for the “red zone” to minimize time exposed to radiation hazards. This preparation work occurs with few hierarchical constraints. As Fournier shows in a chapter case study that details a “red zone” “dive” to repair a broken camera, occupational fractures within a working group are a potential source of danger: factions follow distinct regulations that may contradict each other. Additionally, ordinary work is stressed by leadership conflicts structured by opposing principles of legitimation: young technicians, recently graduated and hired by the company, espouse a technical principle while older workers with seniority espouse an experience principle. This work conflict is inscribed in the history of the nuclear plant work force, built around two waves of recruitment made up of unqualified locals and of an extra-regional population qualified through military, professional or educational training.

In the penultimate chapter, Fournier draws a socio-history of radio-protection occupations, a professional group which only makes up 10% of the plant employees but which has acquired a central role: its members control their own work and set the norms for the others. We find here the major traits of a professionalization process, namely the ability for a group to define and protect a specific territory within the division of work. This professionalization proceeded through the creation of several titles: first, the qualification of radioprotection technician in the late 1960s (in-house training), then a degree of radioprotection superior technician issued by both the National Institute of Nuclear Sciences and Techniques (INSTN) and by the national public education service, and finally an atomic engineering degree delivered by INSTN and implemented in the late 1980s. Hence, if the first generation of technicians was trained on the job or in-house,

the most recent one is mostly made up of engineers who earned their degrees from higher education.

The last chapter is based on a long interview with a retired executive. It gives readers the opportunity to think about the different types of constraints facing workers: economic; organizational (complex procedures, the external control of management, unions, physicians and security experts); and professional, with virile competition between colleagues based on physical performance during interventions. Long interviews are a privileged tool for collecting indigenous categories of perception and interpretation of the social world, as they give the respondent the opportunity to provide precise and idiosyncratic descriptions of professional practices. For instance, the meaning of the term “kamikaze” at the plant has evolved over time. In the 1960s, it referred to the military dimension of work organization, which inspired a spirit of sacrifice among workers in the name of the general interest. In the 1970s, “kamikaze” came to refer to the fear of a productivist ethos ushered in by the transition from military-run to civil industry. In the former context, the nuclear plants was free from strict budget constraints; in the latter, it was exposed to competition from conventional thermic and waterpower-electric production, where workers health protection were seen as production cost. To gain contracts, subcontractors pressured employees to put their health on the line, making them into “REM meat” (from Röntgen Equivalent Man, a unit measuring absorbed radiations), i.e. exposing them to radioactivity until reaching the legal quota and then replacing them. During the 1980s, overzealous, or fast workers were stigmatized as “scabs” (“jaunes”), as they were jeopardizing the efforts made by social partners (management, unions, authorities) to improve on existing programs set to reduce individual exposure to radiations. These ambitions were supported by the growing perception that such improvements were necessary to preserve the nuclear industry at a time when environmentalist activists attacked it. This led to the paradox of a nuclear industry that cannot seem to function correctly unless some part of its employees take calculated but constant risks.

In each chapter, the author meticulously describes the work scenes he observed, took part in and transcribed from numerous testimonies. This book provides ethnographic richness and fully succeeds in its goal of introducing the public to the intrinsically hazardous work of nuclear industry employees. Nevertheless, this study is centered on maintenance workers and there is little information about the operating agents who seem to play an important role in the nuclear plant and appear to influence maintenance work through their use of the machines. Moreover, despite the occasional reference to “virility,” called upon to account for workers behaviors in the “red zone,” this element is not connected to a more general discussion of gender relationships within and outside the work place. Finally, there is a lack of data concerning the nationality and ethnicity of the work force. This said, this book represents a fascinating sociological work and constitutes a genuine handbook for long-term ethnographical field research. Fournier is most convincing when he insists on the importance of a micro-analysis of work conducted under pressure. Errors, conflicts, and incidents constitute an entry point for developing analyses on the organization and nature of work carried out under the risks of irradiation and contamination and give us insight into the cooperation and solidarity among individuals and groups of employees. Likewise, these data enable the study of the shared regulations that exceed the confines of any for-

*Pinna*

mal division of labor, the construction of personal and professional identities on the work place, and the conflicts between generations through a social history of the work force.

*Gabriele Pinna*

Centre de recherches sociologiques et politiques de Paris – Équipe genre, travail et  
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