

ACTIVITY REPORT

2020

2021@Foncsi

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WHAT IS THE FONCSI

FonCSI, the Foundation for an Industrial Safety Culture, is an officially-recognized nonprofit research foundation that was created in 2005.

"To inspire, support and implement single and multidisciplinary research that is in the public interest, and maximize the dissemination of the products of this research in order to:

- improve safety in industrial companies of all sizes, and in all sectors;
- identify the conditions and practices that support an open debate between at-risk enterprises and civil society, with a view to developing a better mutual understanding; and, more generally,
- promote awareness and familiarize all of the actors in society to the problems of risks and industrial safety."

This is the statutory mission of the Foundation for an Industrial Safety Culture, which was officially recognized as a nonprofit organization in the decree of 18 April 2005. Its status as a public-interest organization is particularly important to the FonCSI. It is committed to disseminating the results of its work to as many people as possible.

The Foundation's mission is, therefore, to support and finance interdisciplinary research projects on risks, and the human and organizational factors of safety, and to ensure the transfer of the findings of this research to industrial safety stakeholders.

The new knowledge that results from its work, and the transfer of these outcomes to industry, means that FonCSI can drive forward industrial safety for the benefit of all stakeholders: administrations, associations, local authorities, researchers, companies, trade unions, etc.



A WORD FROM OUR DIRECTOR

2020, Covid, an incentive to increase resilience, and a rich scientific and practical opportunity for the FonCSI.

An unprecedented crisis in troubled times

An unbelievable health crisis began to emerge at the beginning of 2020; and it is still not clear, as 2021 comes to an end, whether it is finally over, although the situation is slowly improving.

This crisis emerged from nowhere, in a period that was already seeing the emergence of two major and competing strategic transformations:

- the first, which had already been underway for several years, reflects a shift towards an
 increasingly unstructured, networked, global and digitalized industrial organization (with
 an incredible capacity for the explosion of available data, KPI, "big data", and the associated new approaches to safety), and
- the second, which has only just begun (and whose content partially conflicts with the
 first) reflects a move towards greening, and an ecological transition consistent with the
 17 sustainable development goals selected by the European Commission.

At the current time, the crisis has impacted all of these dynamics, and created a kind of hiatus in ongoing actions. Some industrial sectors have been hit more heavily, notably tourism and consumer goods, not forgetting transport, rail and aeronautics, the automobile industry, and, as an extension, oil.

Consequently, the term "resilience" has become key

In terms of industrial safety, observations show that the industry has come through the crisis by adapting to degraded conditions. Lessons have been learned from these adaptations, both at the micro level of teams in the field, and at the more macro level of safety governance.

Now that the crisis is passing, the question arises as to the future of these two movements. Will the crisis simply change their agenda, profoundly modify them, or just mark a hiatus, and how, in this context, do we make sense of the transformations and impacts on industrial safety and its perception by the population and authorities, which remain the Foundation's focus?

Unquestionably, the need for a global vision has been reinforced by the crisis. It is almost impossible to talk about the future of industrial safety, and the issues that characterize it, without taking account of the more global transformations that are unfolding in the industrial world. This global, systemic vision is at the heart of FonCSI's approach.

What are the consequences for FonCSI's work?

We were able to fully maintain progress under the "FonCSI 3" program, with an average of only 6 months' delay. This is itself an achievement in the context of the ongoing crisis.

Three strategic analyses have been launched: "Work and workers in the 2040's" and "Contracting relationships in high-hazard industries" have progressed as planned, with multiple national and international events; the third, "The regulator-regulated relationship" was launched in December 2020, again as planned.

A WORD FROM OUR DIRECTOR

At the same time, and based on the lessons learned from the strategic analyses that made up the "FonCSI 2" program, an industrial pilot project was launched with GRDF on the use of a new generation of supports for preparing and monitoring the work of teams in the field (briefing-debriefing).

Furthermore, two working groups have been set up in response to events, one on the post-Covid situation (mentioned above), and the other on the safety culture of the local area, an issue that returned to the agenda with the dramatic accident at Lubrizol (France). In both cases, the Foundation is listening to national and international experts, or political authorities in the domain, thus making a link with the more traditional discussion group approach taken by the Institute for an Industrial Safety Culture (ICSI), which brings together the various actors concerned.

A small team with a big job

Jean Pariès is a leading figure in global academic networks on resilience and natural decision making, and his arrival as Scientific Director for FonCSI and ICSI was very welcome in this context of crisis and change. His expertise has enabled us to launch several initiatives, notably a post-Covid and resilience working group. The international symposium with the Resilience Engineering Association (REA) and the Naturalistic Decision Making (NDM) community, which was coorganized by FonCSI and ICSI in June 2021, also fed into our thinking, as a full day was devoted to the transformation of safety models, in the light of the contributions of these new perspectives.

Jean-Marc Vaugier, on secondment from TotalEnergies, has joined us as Development Director and Assistant Director of the Foundation (and ICSI). We have already benefitted significantly from his industrial background, along with his skills and rigor in planning and the development of a strategic roadmap.

The rest of the team has not changed - including yours truly - and not stopped working in this new period where face-to-face events have been fully replaced by online meetings. Caroline Kamaté and Eric Marsden, our two scientific facilitators, continue to lead the program and our community of experts. They have been helped by Jean-Marc Benchimol, our IT manager (who also works for ICSI) to switch our activities to fully online. Clotilde Gagey and her team have significantly enriched how the Foundation communicates and shares results both within the donor community and beyond.

Last but not least, we must not forget our General Secretariat, headed by Pauline Fabre, which provides indispensable support to our staff, and which has been deeply involved in the process of ensuring administrative compliance and the revision of our statutes, which will be officially validated by the *Bureau des fondations* (Office of Foundations) and ultimately the *Conseil d'Etat* (Council of State).

Ongoing improvements to our methods

2020 was a rich source of methodological innovation.

Over time, our strategic analyses have expanded to include consultations with national and international experts, in addition to 2-day residential seminars. We have also integrated input from other experts, notably the National Academy of Technologies. The result is a much richer analysis, as more experts can be consulted.



René Amalberti, Director of FonCSI

Not once, but twice, we have succeeded - almost beyond our hopes - in replacing the 3-day residential seminars with 48-hour virtual events that bring together a dozen experts from the 5 continents, along with an audience of about twenty permanent experts from the strategic analysis groups.

We have launched new ways of working in virtual workshops; in 2021 we implemented a workshop that brought together 5 experts from the railway sector (industrial directors, professional associations, politicians, authorities) on the theme of the regulatory control of autonomous vehicles (guided transport).

We have equipped ourselves with professional-standard audio-visual equipment, and we can now hold mixed, face-to-face and remote conferences, opening up new opportunities that will endure beyond Covid. We have also begun to equip ourselves with automatic, simultaneous translation technology in languages we are not familiar with - in addition to French, English and Spanish are the Foundation's three working languages - in order to enrich our relationship with experts from distant cultural horizons.

A higher scientific profile

Although this has been a difficult time, we have continued to publish our strategic analyses, and support international networks, such as the NeTWork, through our "SpringerBriefs in Safety Management" open access collection published by Springer, one of the two largest publishers in the world. We have already exceeded 100,000 downloads for two of the seven books we have published, thus contributing to the very high public profile of the Foundation's work.

In parallel, we are continuing to add new volumes to our series of "Cahiers de la sécurité industrielle" in French, which present some practical recommendations and lessons learned from the analyses.

We have also launched a monthly "journal" that records progress with respect to each strategic analysis for the community of FonCSI partners.

All of which suggests that things appear to be going in the right direction. Not least because all of the international experts that we have asked to speak to, whatever their level, have agreed to participate.

To sum up, we will remember 2020 as a very good year, despite the adversities engendered by the Covid crisis. The work that we have been able to accomplish is an opportunity for me to once again say a very big 'thank you' to all the staff of the FonCSI, all of our permanent and invited experts and, looking further afield, all of the experts from industry who have given us their very active support.

René Amalberti, (volunteer) Director of FonCSI

HOW THE FOUNDATION IS ORGANIZED

OUR SPONSORS

By supporting industrial safety research, FonCSI's sponsors actively contribute to its mission of working in the public interest.

In 2019, the new research program "FonCSI 3" (2019-2023) was launched, thanks to the support of nine sponsors, who contributed \in 2.8 million:

- Airbus
- The Directorate General of Civil Aviation (DGAC)
- EDF
- Établissement public de sécurité ferroviaire (EPSF)
- GRTGaz
- Institute for Radiation Protection and Nuclear Safety (IRSN)
- SNCF
- TotalEnergies
- Vinci

THE BOARD OF TRUSTEES¹

The FonCSI is managed by a Board of Trustees which, through its deliberations, sets out the Foundation's agenda.

In 2020, Mr. Thierry Bosch joined the Board, representing INP Toulouse. In addition, Mrs. Marianne Peyrot was appointed Regional Delegate for Research and Technology for the Occitanie region, replacing Mrs. Marie-Elisabeth Borredon. She now sits on the Foundation's Board as a Government Commissioner.

Finally, at the beginning of 2020, following the retirement of Messrs. François Daniellou and Daniel Darets, Messrs. Jean Pariès and Jean-Marc Vaugier, along with Mrs. Pauline Fabre succeeded them as permanent invited members.

The composition of the Board of Trustees is therefore as follows:

Ex officio members

CNRS: Joël Bertrand

• INP Toulouse: Thierry Bosch

• Région Occitanie / Pyrénées-Méditerranée : Bertrand Monthubert

Founding members

• EDF: Cécile Laugier

Engie: Xavier Perret

SNCF: Isabelle Delobel

TotalEnergies: Ahmed Abzizi

Qualified experts

- Bruno Pahlawan
- Michel Descazeaux
- André-Claude Lacoste (Chairman)
- Jean-Paul Labarthe

Government commissioner

Marianne Peyrot, Regional Delegate for Research and Technology for the Occitanie region.

Honorary member

René Deleuze, former Director of ICSI-FonCSI

Permanent invited members

- René Amalberti, FonCSI
- Ivan Boissières, ICSI
- Pauline Fabre, ICSI-FonCSI
- Jean Pariès, ICSI-FonCSI
- Jean-Marc Vaugier, ICSI-FonCSI

THE SECRETARIAT²

In January 2020, Mr. Michel Descazeaux left his position as Secretary to the Board. He was succeeded by Mr. Ahmed Abzizi.

As of 31 December, 2020, the secretariat was composed as follows:

President: André-Claude Lacoste

• Vice-President: position to be filled

Secretary: Ahmed Abzizi

Treasurer: Joël Bertrand

In March 2021 an election was held to renew the mandates listed above, along with confirmation of Mrs. Cécile Laugier as Vice President.

SCIENTIFIC GOVERNANCE³

The Research Commission of the Board of Trustees

The Research Commission of the Board of Trustees is responsible for the overall coordination of the Foundation's scientific program.

Membership: under renewal

Strategic Analysis Scientific Groups (SASG)

The Strategic Analysis Scientific Groups (SASGs) are responsible for carrying out the strategic analyses that make up the Foundation's scientific program. Different groups work on specific themes, in close collaboration with the Foundation's trustees. The following scientific experts are members of the SASGs:

- Corinne Bieder, ENAC
- Laure Bonnaud, Inrae and University Paris Dauphine
- Benoît Journé, University of Nantes
- Hervé Laroche, ESCP Business School
- Jean-Christophe Le Coze, Ineris
- Jesús Villena López, Ergotec
- Jorge Walter, University of San Andrés (Argentina)

Industrial experts, who are chosen as a function of the theme explored by the group, complete the team.

THE TEAM

Following the retirement of Mr. François Daniellou, Scientific Director since 2015, and Mr. Daniel Darets, Secretary General for more than 7 years, Mr. Jean Pariès and Mr. Jean-Marc Vaugier have joined FonCSI's management team as Scientific Director and Director of Development.







Jean-Marc Vaugier, Director of Development

On 1 February 2020, Pauline Fabre took over responsibility for the General Secretariat.

As of December 31, 2020, the FonCSI team was as follows:

- René Amalberti, Director (volunteer)
- Pauline Fabre, General Secretary
- Clotilde Gagey, Communications Manager
- Caroline Kamaté, Program Manager
- Eric Marsden, Program Manager
- Jean Pariès, Scientific Director
- Jean-Marc Vaugier, Development Director

The permanent team is based in Toulouse, France:

6 allée Émile Monso ZAC du Palays - BP 34038 31029 Toulouse Cedex 4 - France

FonCSI shares its premises with the Institute for an Industrial Safety Culture (ICSI) on the campus of the National Polytechnic Institute (INP), which lies south-east of Toulouse, near the town of Labège.

THE END OF "FONCSI 2"

In 2015, the Foundation launched its second, 4-year research program: "FonCSI 2". This program marked the beginning of a new research modality, strategic analyses, on the following themes: skills & competencies for safety; safety culture and models; methods, tools and practical approaches to HOF, etc.

In 2020, two of these strategic analyses came to an end, and activities focused on the dissemination of their outcomes. We take a look back at these two areas of work.

SKILLS & COMPETENCIES FOR SAFETY

Strategic analysis

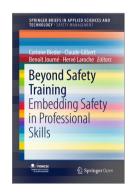
The strategic analysis on skills and competencies for safety was launched in January 2015, coordinated by Caroline Kamaté, program manager at FonCSI. Five industrial experts joined the Strategic Analysis Scientific Group (SASG): Franck Guarnieri (CRC Mines ParisTech), Pol Hoorelbeke (TotalEnergies), Jean-Paul Labarthe (EDF), Nicolas Herchin (Engie), and Philippe Haller (Arkema).

After conducting a review of the state-of-the-art of knowledge on skills & competencies, in November 2015 the group organized an academic seminar with the following world-renowned experts:

- Petter G. Almklov, Norwegian University of Science and Technology (Norway)
- Linda Bellamy, White Queen Safety Strategies (Netherlands)
- Vincent Boccara, Université de Paris-Sud (France)
- Paul Chadwick, University College London Centre for Behaviour Change (UK)
- Rhona Flin, Aberdeen University (UK)
- Silvia Gherardi, Université de Trente (Italy)
- Jan Hayes, Royal Melbourne Institute of Technology (Australia)
- Pascal Ughetto, Université de Paris Marne-la-Vallée (France)

A seminar to present the outcomes of the analysis to industrialists took place on 17 March 2016, at Engie R&D in Paris Saint-Denis. About twenty representatives of various industrial sectors (transport, energy, petrochemicals, chemicals, etc.) were able to discuss the results of the analysis with SASG members, and explore future avenues for progress.

In 2016 and 2017 our international experts and members of the SASG dedicated themselves to the preparation of an academic book, which was published in English by Springer in October 2017: Beyond Safety Training. Embedding Safety in Professional Skills. This open access publication was downloaded from the Springer website more than 12,000 times in the first month after its release; it reached 100,000 downloads in 2021.





In November 2018, a French summary of the results of the strategic analysis was published in the Foundation's "Cahiers de la sécurité industrielle" collection under the title: La sécurité, une affaire de professionnels? This "Cahier" summarizes the main ideas and avenues for improvement that were identified, and is intended to be useful at the operational level.

In parallel, the Foundation published the comic book entitled L'opérateur, le manager... et le monstre de l'es-

pace, which was adapted from Hervé Laroche's highly original chapter included in the Springer "Beyond Safety Training" book. This entertaining comic book is intended to reach a wide audience, and open the debate on alternatives to traditional safety training.

As FonCSI's goal is to reach an international audience, an English version, "The operator, the manager... and the monster from outer space" was published in May 2020.





Call for proposals

As part of the "FonCSI 2" research program (2015—2019), the Foundation funded six research projects, coordinated by Eric Marsden, Program Manager, through a call for proposals on skills & competencies for safety:

- The "Transformations of activities, operators and organizations: towards proposals for training in and through resilience" project was headed by Germain Poizat (University of Geneva, Switzerland)
- The "Evaluation of safety training systems: work, actors, pathways" project was headed by Catherine Delgoulet (Université Paris Descartes, France)
- The "For an evaluation of the contribution of digital technologies in risk management training in at-risk industries" project was headed by Alain Garrigou (IUT Bordeaux, France)
- "The professionalization of safety: an exploratory qualitative and quantitative study" project was headed by Wim Van Wassenhove (CRC Mines ParisTech, France) and Hervé Laroche (ESCP Business School, France)
- The "Becoming actors in prevention: designing mechanisms to develop the 'Power to act' in safety" project was headed by Lucie Cuvelier (University Paris 8, France)
- "A multimethod system for the assessment and training of teamwork in simulated scenarios" was headed by Fabrizio Bracco (University of Genoa, Italy)

All of the projects financed by the FonCSI under the program had a clear practical focus, either in the form of observations and experiments conducted onsite at industrial facilities (Engie, Enedis, SNCF, hospitals, etc.), or at places dedicated to safety training/development (simulation, 3D virtual environment, etc.), or in the form of analyses of data or documents produced as a result of this type of activity (qualitative and quantitative studies produced in the context of ESCP's and ICSI's Specialized Masters' programs, etc.).

On 13 April 2018, a seminar was held with the funded research teams at ESCP Business School. A study of the costs and benefits of different safety knowledge and skills development systems (classroom training, distance learning, mentoring, the use of simulators, role-playing, semi-formal practices implemented within professions and communities of practice), prepared by Dédale SA at the request of FonCSI, was published in the "Cahier de la sécurité industrielle" collection.

The majority of the research projects funded under the skills and competencies call were completed in 2019 or early 2020, and resulted in the following publications:

 The "Cahier de la sécurité industrielle" entitled Benchmark des dispositifs formateurs sur la sécurité des activités industrielles [Benchmark of training systems on the safety of industrial activities], by Sébastien Maitrehenry, Luigi Macchi, Claude Valot and Jean Pariès, was published in 2018:

• The "Regard sur la sécurité industrielle" entitled Contribuer à la sécurité industrielle « par le facteur humain »: Un regard pour aider à (re)penser la formation [Contributing to industrial safety through "the human factor": An insight into how to (re)think training], by Simon Flandin, Germain Poizat and Romuald Perinet, was published in 2019.





Conference

FonCSI organized a conference on professionalization and industrial safety in 2018 at ESCP Business School. Nearly 170 people (industrialists from all sectors, trade unions, institutions and academics) participated in this event, which aimed to bridge the gap between research and practice in the field, by disseminating the outcomes of the strategic analysis on the theme, along with the initial results from teams funded under the call for proposals. The Foundation invited industrialists (GRTgaz, EDF R&D, Enedis) to talk about the initiatives that they have put in place to help operational staff to train, prepare themselves and become more professional.

This conference also provided an opportunity to promote two of FonCSI's publications: the "Cahier" *La sécurité*, *une affaire de professionnels*?, and the comic book "*L'opérateur*, *le manager*... *et le monstre de l'espace*".

Wrapping up 2021

An "Cahier de la sécurité industrielle" prepared by the University of Geneva's research team, entitled Proactivité et réactivité: Deux orientations pour concevoir des dispositifs visant le développement de la sécurité industrielle par la formation [Proactivity and Reactivity: Two directions for designing systems that aim to improve industrial safety through training], was published in early 2021.



HOF: METHODS, TOOLS AND PRACTICAL APPROACHES

Strategic analysis

The strategic analysis on "Methods, tools and practical approaches to human and organizational factors", coordinated by Caroline Kamaté, was launched in March 2017, in the context of the "FonCSI 2" research program.

Nicolas Herchin (Engie), Valérie Lagrange (EDF), Jean-Christophe Le Coze (Ineris), Christian Neveu (SNCF), Philippe Noël (TotalEnergies) and Myriam Promé (ICSI) were selected as industrial experts to reinforce the SASG in this strategic analysis of the human and organizational factors of safety.

In 2017, a review of the state-of-the-art was completed and the results were used to select several international experts to participate in the research seminar. In addition, the FonCSI published Les FHO dans l'entreprise: trois rails éclatés [Human and organisational factors in companies: on three separate tracks?], an "Tribune" written by René Amalberti, Director of FonCSI. The text of this "Tribune" was presented at the launch of the strategic analysis, in order to stimulate the debate. The English version was published in 2018.

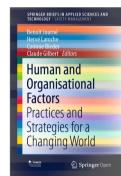
The international academic seminar was organized in January 2018 near Paris. Eight experts from Europe and South America participated:

- Ivan Boissières, ICSI (France)
- Caroline Lacroix, University of Evry-Val d'Essonne Paris-Saclay (France)
- Daniel Mauriño, independent consultant (Argentina)
- Kathryn Mearns, Wood PLC (UK)
- Florence Reuzeau, Airbus SAS (France)
- Paul Schulman, Mills College (USA)
- David Woods, The Ohio State University (USA)
- Brendan Ryan, Nottingham University (UK)

The seminar that was organized to feedback the outcomes of this strategic analysis to industrialists took place on 18 September 2018 at TotalEnergies in Paris-La Défense. More than 60 representatives of various industrial sectors (transport, energy, petrochemicals, chemicals, etc.) were able to discuss the results of the analysis with SASG members, and explore

future avenues for progress.

Early 2020 saw the publication of an open access version of the book in English: "Human and Organisational Factors. Practices and Strategies for a Changing World", by the international publisher Springer. All of the participants who attended the January 2018 research seminar (both international experts and SASG members) contributed.



Wrapping up 2021

In September 2021, industrialists from all sectors — unions, institutions and academics — were invited to attend a conference in Paris, with the objective of bridging the gap between research and practice in the field, by transmitting the results of the strategic analysis on this theme.



The international academic seminar, held in 2018.



The strategic analysis feedback seminar, held in 2018.

THE LAUNCH OF "FONCSI 3"

In 2019, the Foundation launched its new scientific program "FonCSI 3", which will continue until 2023. Several strategic analyses will be conducted during these 4 years (Work and workers in the 2040's, Contracting relationships in high-hazard industries, the regulator-regulated relationship, etc.) together with working groups (risks and the local area, the impact of the Covid-19 crisis) and a pilot (resilient briefing-debriefing).

WORK AND WORKERS IN THE 2040'S

Strategic analysis

The first strategic analysis of the "FonCSI 3" program, entitled "Work and workers in the 2040's", was launched in May 2019. It is coordinated by Caroline Kamaté.

With an eye on the international community, a video presenting the strategic analysis in English was produced by the FonCSI team, and published on the Foundation's website in 2019.



Florence Reuzeau (Airbus), Raluca Ciobanu (EDF), Bruno Dember & Laurent Cebulski (EPSF), Franck Ollivier (Eurovia), Nicolas Engler & Thierry Escaffre (GRTgaz), Alexandre Largier & Sylvie Thellier (IRSN), Stella Duvenci-Langa & Cyril Cappi (SNCF), Raphaël Waxin (TotalEnergies) and Dounia Tazi (ICSI) were chosen as industrial experts to strengthen the Strategic Analysis Scientific Group for (SASG) in this study on the contribution of operators in at-risk industries between now and 2030.

In 2020, the SASG met eight times, by videoconference, in order to continue the work that had started in 2019. A session on the theme was organized at the Académie des technologies in February 2020, and the contributions from the following industrial and scientific experts provided further food for thought for the SASG:

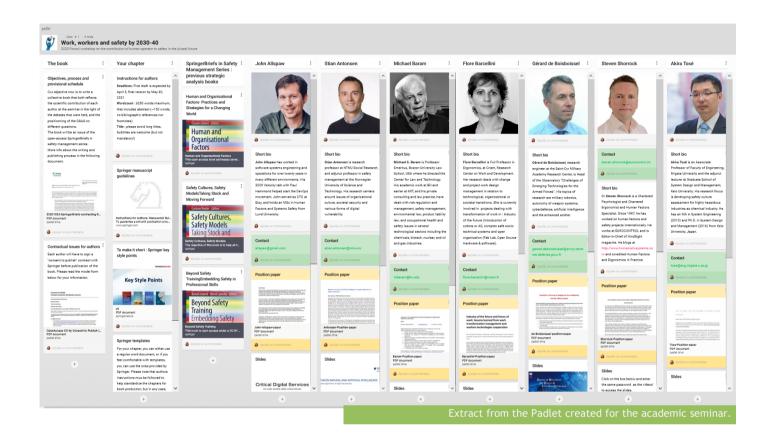
- Thierry Weil (Mines ParisTech),
- Vincent Charlet (Fabrique de l'industrie).
- Jean-Hugues Rodriguez (Airbus),
- Pierre-Noël Giraud (CERNA, Académie des technologies),
- and André Richier (European Commission).

The Covid pandemic prevented the planned academic seminar at the Abbaye de Royaumont from being held as planned; instead, it took place from 16 to 18 November 2020 as a fully virtual event. The meeting brought together 28 participants, including 7 international guests:

- John Allspaw (Adaptive capacity labs, USA),
- Stian Antonsen (Norwegian University of Science and Technology, Norway),
- Michael Baram (Boston University Law School, USA),
- Flore Barcellini (Cnam, France),
- Gérard de Boisboissel (Centre de recherche des écoles de Saint-Cyr Coëtquidan, France),
- Steven Shorrock (Eurocontrol, UK),
- and Akira Tosé (Université de Niigata, Japan).



Six of the seven guests' contributions were pre-recorded and put on a Padlet specifically created for the event.



A journal series has been created for FonCSI's sponsors and partners to summarize the progress of the strategic analysis linked to the SASG's studies and outcomes. Three issues of the *Journal* were published in April, July and December 2020.



Wrapping up 2021

A workshop dedicated to railway safety of the future was organized in March 2021. This event brought together five invited experts from the rail world, and was based on a futuristic scenario prepared by EPSF and SNCF members of the SASG, which expressed their views on the major safety challenges in the sector for 2030-40.

The seminar that was organized to report the outcomes of this work to FonCSI's partners was delayed due to the Covid crisis, and was re-scheduled for 1 July 2021. It was hosted by TotalEnergies at Paris-la Défense.

Further meetings with experts may also be organized in the final phase of the strategic analysis.

CONTRACTING RELATIONSHIPS IN HIGH-HAZARD INDUSTRIES

Strategic analysis

The second strategic analysis that makes up the "FonCSI 3" program, is entitled "Contracting relationships in high-hazard industries", and was launched in May 2019. It is coordinated by Eric Marsden. Here, the focus is on the manufacture of safety in the relationship between principal contractors, subcontractors, and other types of partners in at-risk activities.

With an eye on the international community, a <u>video presenting</u> the <u>strategic analysis</u> in English was produced by the FonCSI team and was published on the Foundation's website in 2019.



Jean-Yves Bligny (SNCF), Mohamed Chalabi (SNCF Réseau), François Jeffroy (IRSN), Florence-Marie Jégoux (DGAC), Nicolas Lot (EDF Lab), Céline Poret (IRSN), Sophie Rougé (Airbus) and Sébastien Roulier (TotalEnergies) were chosen as industrial experts to strengthen the Strategic Analysis Scientific Group (SASG) working on this study.

During the first few months of 2019, the group familiarized themselves with the problems encountered by industrialists when working with partners and subcontractors, carried out a literature review, and began to develop a profile of subcontracting or industrial partnership situations and the associated safety challenges. The group also benefited from hearing some first-hand accounts from the following industrial experts:

- Régis Demeer from Air France's Flight Safety Department,
- And Christiane Ginestou, QSSE & CSR Director at Ponticelli Frères (a leading subcontractor).

In 2020, the SASG met five times by videoconference (due to the pandemic). The group continued its analysis of the academic literature on the evolution of partnership and subcontracting relationships between companies.

Several issues of the *Strategic Analysis Journal* were devoted to the impact of megatrends, such as the financialization of the economy, globalization and the rise of the platform economy, on inter-company relations; the impact of the growing importance of environmental, social and governance (ESG) criteria on the strategic choices of large industrial groups and the governance of relations with the supply chain and partners; and the rise of private para-regulatory systems.



The SASG also organized an international seminar. This virtual event ran from 28 to 30 October 2020, and brought together the following international experts:

- Petter Almklov ((Norwegian University of Science and Technology, Norway)
- Nadezhda Godcheva (VTT VTT Technical Research Centre, Finland),
- Colin Pilbeam (University of Cranfield, UK)
- Bruce Pinnington (University ofLiverpool, UK),
- Michael Quinlan (University of New South Wales, Australia),



P. Almklow



N. Godcheva



C. Pilbeam



B. Pinnington



M. Quinlan

in addition to contributions from several members of the strategic analysis. These interventions were pre-recorded and made available, along with written contributions on a mini-website that was developed especially for the occasion, and which facilitated the smooth running of the seminar.

Wrapping up 2021

The group is continuing its analysis of the diversity of partnership and subcontracting arrangements found in the various industrial sectors that are represented, with the aim of highlighting various initiatives that could, potentially, be shared more widely. An industrial seminar was organized in the last quarter of 2021 to present the results of this work.

RELATIONS BETWEEN REGULATORY AUTHORITIES AND INDUSTRY

Strategic analysis

The Foundation's third strategic analysis under the "FonCSI 3" program is entitled "Relations between regulatory authorities and industry", and it was launched at the end of 2020. It is coordinated by Eric Marsden. It is an extension of the study undertaken by the working group on the regulator-regulated relationship that was carried out in 2017-2018 in the context of the "FonCSI 2" program.

The aim is to analyze the relationship that develops over time between regulatory authorities and companies that manage at-risk activities. This relationship is an important contributor to the production of safety, and ensuring the effective management and control of industrial risks. It also plays a critical role in the social acceptability of these activities, and the development of trust in the governance of sites and activities that are at risk of a major accident.

The importance of effective safety oversight becomes most evident when it is lacking; this point is illustrated by the recent failure of the Boeing 737 Max certification process, which has been widely criticized for its lack of rigor and decoupling of financial and safety considerations.

In this study, the following experts from industry or regulatory authorities were selected to strengthen the Strategic Analysis Scientific Group (SASG):

- Olivier At (EPSF),
- Olivier Chanton (IRSN),
- Cécile du Cluzel (DGAC),
- Jean-Philippe Daniel (EPSF),
- Guilhem Nicolas (DGAC),
- Olivier Guillaume and Cécile Laugier (EDF)
- and Jean-François Lechaudel (TotalEnergies).

The following academics are also contributing to the study: Laure Bonnaud (Inrae/ Paris Dauphine University), Jean-Christophe Le Coze (Ineris) and Benoît Journé (University of Nantes).

The initial discussions, which took place in 2020, identified the main themes of interest to participants. They include: how internal and external regulations work together; the role of third parties in the regulator-regulated relationship; the effects of

judicialization; the economic efficiency of regulation; the regulation of highly digitized systems; and the regulation of issues related to the organizational culture and its impact on safety.

A *Strategic Analysis Journal*, published in early 2021, and shared with FonCSI's partners, was dedicated to the launch of this analysis.



Wrapping up 2021

The group began by hearing first-hand accounts from professionals and international researchers who had conducted work that was relevant to the group's study. An initial exchange of views between participants addressed the role of different categories of third parties (private auditors, insurers, authorized bodies within the meaning of European regulations, associations and NGOs, the judiciary, elected representatives, the media) in the regulator-regulated relationship.

RISKS & TERRITORIES

The working group

In September 2020, the FonCSI launched a working group on "Risks & Territories: Governance and citizen participation". Drawing upon its earlier work on this topic, and in the light of the recent events at Lubrizol and the global crisis linked to Covid-19, which could reshuffle the cards of risk perception, the mission of this group is to study the scientific principles and the renewed operational conditions for a constructive debate between stakeholders at the local scale. The perspective adopted by the group is European, with a focus on the characteristics of the situation in France.

This working group is co-chaired by Caroline Kamaté and Jean-Marc Vaugier. It also includes three external experts:

- Corinne Bieder, National Civil Aviation School (Enac), Toulouse, France,
- Paolo Crivellari, University of Toulouse 3, France, and
- Emmanuel Martinais, École nationale des travaux publics de l'Etat, Lyon, France

together with FonCSI's Scientific Director, Jean Pariès, and its Director, René Amalberti.

The group aims to enrich its investigation of the topic by hearing from academic experts, industrial or political decision-makers and actors working in the field. The first person to be invited to speak to the group was Marco Ziron, an engineer at the Veneto Regional

Agency for the Prevention and Protection of the Environment (ARPAV) in Italy, in November 2020.

The group collaborates with, and complements the work of the "Alert process and crisis management" discussion group led by the Institute for a Culture of Industrial Safety (ICSI) and Amaris (a



M. Ziron

national association of local authorities to manage major technological risks), notably the chair of each group attends the other group's meetings.

Wrapping up 2021

In 2021, the group heard from other experts and prepared a deliverable.

IMPACT OF THE COVID CRISIS ON SAFETY MANAGEMENT STRATEGIES

The working group

The Covid-19 crisis has wreaked havoc on certain safety practices, notably those related to teamwork, which has become more difficult. Not only have adaptations had to be made, but also more profound changes, in the medium and long term, are emerging as a result of the changes to industry brought about by the crisis.

The economic crisis has led to different choices being made about the globalization, capitalization and fragilization of companies, and investment priorities. Can the strategies that were set out before the crisis still be implemented? Or will the crisis force us to take another look at more ecological, sustainable, and localized trade-offs with the aim of supporting local business?

Today, we are in the midst of the crisis, and safety appears to be presented as a safe haven in almost all of the public conversations about the current situation. However, the extent of the changes in whichever direction, could have a greater impact than we think on tomorrow's safety methods: greater resilience, new certification techniques, a reduced role for the state... It is possible that this could also lead to companies being given greater autonomy to manage the specific characteristics of their context, greater tolerance for managed safety and the contribution of the human being, or to less pressure to reduce safety expenditure.

In May 2020, FonCSI launched a working group to explore these questions. The team of FonCSI participants (Eric Marsden, Jean Pariès, Jean-Marc Vaugier, René Amalberti) are supported by several external experts:

- Hervé Laroche (ESCP Business School),
- André Lannoy (IMdR),
- Thierry Weil (Mines ParisTech)
- and Ivan Boissières (ICSI).

In 2020 and early 2021, the group met with several national and international experts:

- André-Claude Lacoste (President of FonCSI, former President of the ASN),
- Jacques Repussard (former Director General of the IRSN),

- Frédéric Delorme (President of Rail Logistics Europe),
- Christian de Boissieu (member of the Circle of Economists).
- David Woods (Ohio University, USA),
- and Jean de Kervasdoué (member of the French Academy of Technologies).



A-C. Lacoste



Ch. de Boissieu



J. Repussart



D. Woods



F. Delorme



J. de Kervadoué

Wrapping up 2021

The group completed its work at the end of 2021. Preliminary results were presented at the international symposium organized by the FonCSI in collaboration with the REA and the NDM community in June 2021.

RESILIENT BRIEFING-DEBRIEFING

The pilot

Consistent with its mission of transferring research to the field, FonCSI aims to set up, with the Institute for an Industrial Safety Culture (ICSI), a pilot project to help industrialists to understand the outcomes of academic research, and operationalize them in the field. The aim is for FonCSI and ICSI teams to work together, from the initial stages of research projects, in order to develop tools that will be tested and, if successful, used and deployed within industries and organizations.

In the context of the "Preparation and Execution of Work" component of its "Vision 2021" South-West Safety Action Plan, GRDF Sud -Ouest approached FonCSI's experts, to ask for help in professionalizing its theories and practices. The company provided FonCSI with an opportunity to test an experimental briefing-debriefing approach that aimed to improve the reliability and safety of its network operations (installing connections, etc.). The project was launched in June 2019.

The operational objectives of this pilot project are, for FonCSI and GRDF Sud-Ouest:

- to co-construct an approach and associated tools,
- to test them in the field and adapt them, and
- if they prove to be appropriate and are evaluated positively, to implement them more widely within the company.

FonCSI's overall objectives for the project are:

- to test, in the field, the theoretical/methodological concepts related to briefing that have been identified by researchers as contributing to improving the level of safety of activities;
- to observe and analyze the on-site experiment;
- to generalize and publish the results.

In the context of the project, FonCSI representatives are participating in GRDF Sud-Ouest's "Work preparation" working group. After an initial phase of immersion/ observation in the field (agencies, the operations office and on-site) in 2019, the working group developed and validated a tool to help in preparing briefings, and briefing/ debriefing materials for preparers and site managers. The Covid-19 pandemic led to the original schedule being delayed,



and a second phase of immersion in agencies and on-site to test these materials took place during the summer of 2020. The rest of 2020 was devoted to analyzing feedback from the field, and improving the materials to produce a new version, which was validated by the working group in December 2020.

Wrapping up 2021

The new version of the support materials was tested internally by GRDF. The Foundation plans to produce and disseminate a deliverable on this initial pilot in order to exploit the lessons learned.



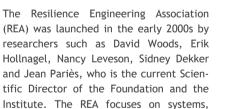
INTERNATIONAL NETWORKS

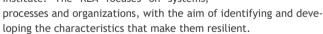
COLLABORATION WITH THE REA AND THE NDM COMMUNITY

The Covid-19 crisis has highlighted the need to know how to organize, decide, arbitrate and manage under uncertainty. The sudden emergence of a completely unforeseen pandemic has destabilized risk management models that are deeply founded in notions of anticipation and predetermination. In order to reflect on these issues, and propose new forms of industrial safety management, the FonCSI, together with the Institute for an Industrial Safety Culture (ICSI), has joined forces with two renowned international networks and schools of thought: the Naturalistic Decision Making (NDM) community, and the Resilience Engineering Association (REA).

AATURALIS)

The Naturalistic Decision Making (NDM) community is led by Gary Klein, cognitive psychologist and best-selling author. This school of thought seeks to make the "natural", rapid and intuitive decisions that are taken by operators in dynamic and uncertain situations more reliable.





These two communities came together to organize several joint initiatives that FonCSI and ICSI participated in, notably a symposium that ran from 21 to 24 June 2021.

To find out more about the NDM community and the REA:

https://naturalisticdecisionmaking.org/

https://www.resilience-engineering-association.org/

Wrapping up 2021

The Foundation and the Institute co-organized, with the REA and the NDM, an international academic symposium that ran from 21 to 24 June 2021. Participants either attended in person, at the Ecole Nationale d'Aviation Civile (Enac) at Toulouse, or by videoconference. In particular, 23 June was dedicated to the issues that concern industrialists, and the theme for the day was: "Is the at-risk industry in need a safety management paradigm shift?".



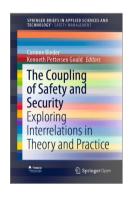
The day featured roundtables with leaders of major organizations and industrial groups (Airbus, EDF, IRSN, SNCF, TotalEnergies, Systra, etc.) and presentations by international experts (René Amalberti, Sidney Dekker, Gary Klein, Jean Pariès, David Woods, etc.).

THE NETWORK

The Foundation supports NeTWork (New and emerging Technologies and Work), which is a network of the world's leading scientific specialists on at-risk organizations. The Foundation provides funding and organizes the annual seminar. It also coordinates the publication of the results of the seminar in an open access book published by Springer, which is part of the "SpringerBriefs in Safety Management" collection.

Publications

In 2020, the book that resulted from the 2018 NeTWork seminar was published in the "SpringerBriefs in Safety Management" series. Entitled "The Coupling of Safety and Security. Exploring Interrelations in Theory and Practice", the authors explore the synergies and tensions between the problems of "safety" (accident prevention is a term that generally translates into French as "sécurité industrielle", but the nuclear sector uses "sûreté") and "security" (the prevention of malicious actions. which translates into



"sécurité" in the nuclear sector, and "sûreté" elsewhere). The issues are addressed from a variety of perspectives, and combine contributions from many disciplines. The two concepts are defined, and the authors examine the methodological, organizational and institutional implications of their approach, by addressing them both separately and in combination.

Seminar and Wrapping up 2021

The seminar that was planned for 2020 was postponed to September 2021 due to the Covid pandemic. The theme of the seminar was "Safety in the digital age: old and new problems. Algorithms, machine learning, big data & artificial intelligence" and it was led by Jean-Christophe Le Coze (Ineris, France) and Stian Antonsen (Sintef, Norway).

To find out more about the NeTWork: www.network-network.org

SAF€RA

The FonCSI is actively involved in the European consortium for industrial safety research, Saf€ra. This consortium regularly organizes calls for research proposals that bring together actors in European research, whether they be program owners (ministries, research agencies) or specialized institutes. Partners participate in projects by allocating months of the time of their experts and researchers. Saf€ra also organizes symposia to present the teams that are selected following the various calls for proposals, together with the results of projects. The FonCSI manages the European calls for proposals within the Saf€ra framework.



Calls for proposals

The consortium's 2020 call for proposals was on the theme of "Safety concerns and opportunities related to advanced materials and new technologies in energy production and storage". The call provides funding for work that explores the role of new materials (for example, nano-structures) in energy storage, in particular, new battery technologies, at different phases of the product life cycle, including the little-explored phase of reprocessing. Four projects have been selected under this call, with total funding of €1.5M.

In addition, in response to the Covid-19 pandemic, Saf€ra launched a "flash" call for proposals at the end of 2020 on the theme of "Industrial safety in the context of pandemics and exponential change". The call will fund projects that aim to provide feedback on the effects of the pandemic on industrial safety, and innovation in terms of organizational and societal resilience. It also supports the continuation of work on the use of nanostructure materials in filtration devices and personal protective equipment.

To find out more about Saf€ra: www.safera.eu

PUBLICATIONS

SPRINGERBRIEFS IN SAFETY MANAGEMENT

A partnership with Springer

Since 2016, the FonCSI has published an open access collection, "SpringerBriefs in Safety Management", with the scientific publisher Springer. The collection is dedicated to the topic of risk management and decision making in at-risk environments. Thanks to insights from many different disciplines — ranging from the humanities to engineering sciences, psychology, economics, law and management — the collection explores new topics related to safety management, anticipates the operational challenges faced by industries, not forgetting the concerns of society.

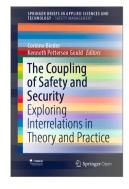


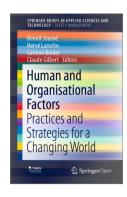
FonCSI's publications in the series are mainly intended for academics, experts, and practitioners. The concepts and results that are presented are relevant to all at-risk industries, including energy, chemicals processing, transport, and services (notably healthcare).

Consistent with the FonCSI's status as a public interest research Foundation, the works published in this collection are all open access publications. The entire collection is free to download, under a Creative Commons license. All you have to do is visit the Springer website.

Two publications in 2020

Two books were published in 2020:





- The Coupling of Safety and Security. Exploring Interrelations in Theory and Practice, the result of NeTWork's work at the 2018 seminar.
- Human and Organisational Factors. Practices and Strategies for a changing world, the outcome of the strategic analysis of HOF methods, tools and practical approaches in the context of the "FonCSI 2" program.

Our most popular books

Seven of the books published by the FonCSI have been very successful, reflected in the number of downloads¹:

- The Coupling of Safety and Security (2020): 14,000 downloads
- Human and Organisational Factors (2020): 78,000 downloads
- Exploring Resilience (2018): 96,000 downloads
- Safety Cultures, Safety Models (2018): 128,000 downloads
- Risk Communication for the Future (2018): 59,000 downloads
- Beyond Safety Training (2017): 100,000 downloads
- The Illusion of Risk Control (2017): 65,000 downloads

Two other books have been downloaded more than 100,000 times: Beyond Safety Training and Safety Cultures, Safety Models.

Wrapping up 2021

Two new books are in preparation. One will be the outcome of the strategic analysis on "Work and workers in the 2040's"; and the second will be the result of the 2019 NeTWork seminar on "Visualising Safety, an exploration: Drawings, pictures, images, videos, movies".

Find out more about the "SpringerBriefs in Safety Management" collection:

> www.foncsi.org/fr/publications/springerbriefs

¹ Figures are from the end of April 2021

FONCSI'S COLLECTIONS

Cahiers de la sécurité industrielle (Industrial Safety Notebooks)

Since 2008, the FonCSI has published the "Cahier de la sécurité industrielle" series, in collaboration with ICSI.

In 2020, preparations began for a new "Notebook". This publication, the outcome a research project led by the University of Geneva, and financed under the "Professionalization and Industrial Safety" program, addresses the topic of proactivity and reactivity as guidelines for designing resilience training programs. The Notebook was published (in French) in early 2021.

Tribunes de la sécurité industrielle (Industrial Safety Opinion Pieces)

The FonCSI began publishing its "Tribunes de la sécurité industrielle" series in 2013. The aim of this collection of short opinion pieces is to stimulate debate on critical topics related to industrial safety.

In 2020, the Foundation published an "Tribunes de la sécurité industrielle" by Jean Pariès, Scientific Director of FonCSI and ICSI titled *Crise de la Covid-19 : quelle résilience ?* In this piece, Jean Pariès, who is a specialist in resilience, deciphers the Covid-19 pandemic through the prism of resilience. His analysis also provides food for thought on the management of current and future industrial risks. It was translated into English and published, also in 2020, under the title "What does the Covid-19 crisis teach us about resilience?"





Wrapping up 2021

In 2021, FonCSI launched a series of "Tribunes" to stimulate debate on the topics of the concepts of expertise and rule-based safety and managed safety. Three "Tribunes" were published on the subject in French, English and Spanish.

THE COMIC BOOK

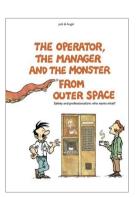
At the end of 2018, the FonCSI published a short comic book entitled *L'opérateur*, *le manager... et le monstre de l'espace*. Sécurité et professionnalisation : qui veut quoi ?

The FonCSI chose the comic strip format to disseminate the outcomes of its strategic analysis on the topic of professionalization. Hervé Laroche, a research professor in management science at ESCP Business School, is the author of a highly original scientific article that the FonCSI included in the book "Beyond Safety Training", published by Springer. This article, written in the form of a dialogue, was a natural candidate for adaptation into comic strip format.

This entertaining comic book revolves around a discussion between a manager and an operator, and uses the conversation to explore alternative or complementary practices to complement traditional safety training programs.

In 2020, it was translated into English, under the title "The *operator*, the manager and the monster from outer space".





Find out more about FonCSI's publications:

> www.foncsi.org/fr/publications

DISSEMINATION

SOCIAL NETWORKS

LinkedIn

The FonCSI has been a member of LinkedIn, the leading international professional social network, since June 2020. LinkedIn allows the Foundation to communicate with as many people as possible about how its research is progressing, to promote its publications and its different collections (Springer, notebooks, viewpoints, opinion pieces, etc.), and to invite people to participate in events (webinars, conferences, symposia, etc.) on the topic of industrial safety.

A year after its creation, the account has almost 500 subscribers, both in France and further afield, from the worlds of research and industry (industrial safety specialists, QHSE managers, safety directors, etc.), along with trade unions and expert consultants.

In 2020, the FonCSI published more than twenty posts, which generated a few hundred to more than 2000 views.

Follow the FonCSI on LinkedIn: https://www.linkedin.com/company/foncsi/



Twitter¹

The Foundation created its "Culture Sécurité@LaFonCSI" account on Twitter in 2012, and has posted more than 1000 tweets since its creation. The FonCSI uses Twitter to share news and debate issues related to industrial safety. The account has more than 600 subscribers.

In 2014, the Foundation created an English-language account, "Safety Culture@TheFonCSI", which has nearly 400 followers. More than 400 tweets have been posted since its creation.

Follow the FonCSI on Twitter: En français https://twitter.com/LaFonCSI En anglais https://twitter.com/TheFonCSI



NEWSLETTERS

The FlashWeb

For over 8 years, the FonCSI has shared a monthly newsletter, the "FlashWeb", with its community. This newsletter is an opportunity to keep subscribers up-to-date with the Foundation's most important developments:

- progress on ongoing research projects (the operator of the future, the impact of the COVID crisis, the relationship with contractors, risks and the local area, the regulatorregulated relationship, etc.);
- new publications (SpringerBriefs, Cahiers de la sécurité industrielle, Tribunes, etc.), all of which can be downloaded for free:
- conferences organized by the FonCSI;
- a monthly insight into the scientific literature and recommended reading.



In 2020, the FlashWeb had more than 800 subscribers: the community ranges from researchers and experts working on the Foundation's projects, sponsors and partners and, more broadly, anyone who registers to receive it.

Interested in finding out more?
> register for the FlashWeb newsletter

Strategic Analysis Journals

In 2020, the FonCSI created a new way to communicate in greater depth, and more regularly with the members of the Foundation's Board of Trustees and the sponsors of its "FonCSI 3" program (Airbus, DGAC, EDF, EPSF, GRTGaz, IRSN, SNCF, TotalEnergies and Vinci), about progress on its strategic analyses.

Entitled the "Strategic Analysis Journal", the aim of this brief update is to inform recipients of progress regarding the Foundation's ongoing strategic analyses. In 2020, three "Journals" were prepared to report the initial results of the "Operator of the Future", and three others reported on the "Relationship with Contractors" analysis. In early 2021, stakeholders were updated on the launch of the strategic analysis on the topic of "The Regulator-Regulated Relationship".

¹ Figures are from the end of May 2021

THE WEBSITE

FonCSI's website was launched in 2013. It provides information about the work of the Foundation, the research projects that it coordinates, its open access publications (SpringerBriefs, "Cahiers de la sécurité industrielle", "Tribunes", etc.), news, etc.

Visit the FonCSI's website:

> www.foncsi.org/en

Wrapping up 2021

At the beginning of 2021, the website was expanded to include a new section: "Recommended reading"(in French). Each month, the FonCSI team provides an insight into 3 to 5 scientific articles on industrial safety topics. These insights are also distributed via the "FlashWeb" and on LinkedIn.

