

Safety Inspection Task Force

(French acronym: IGS)

Summary Report

Safety Inspection Task Force (French acronym: IGS)

In 2009, Total experienced a succession of very serious accidents that left everyone shaken.

The analyses undertaken should enable us to determine the causes of each accident and learn and share the necessary lessons, as appropriate.

While the specific findings may differ for each accident, they all occurred after safety performance had improved significantly across all of our businesses, putting us on a par with our competitors.

International oil companies have been regularly comparing methods, standards and results for a number of years to continuously improve the safety of their operations. Thanks to this collaborative approach, as well as external audits conducted in accordance with internationally recognized protocols, best practices can be identified and shared across the industry.

Even though the circumstances surrounding each of the accidents in France since the beginning of 2009 were very different, their severity and the fact that they occurred over a relatively short period of time necessitated a detailed reexamination of the effectiveness of our safety procedures and standards. That is why on August 6, 2009 senior management decided to set up a Safety Inspection Task Force for our main French sites presenting technological risks: six refineries, two petrochemical plants, three fertilizer plants, a production facility and a natural gas storage facility.

The task force began its work in September 2009 and completed it in late January 2010. Eleven people contributing expertise in various fields (including safety, operations, inspection, maintenance, processes and human resources) and representing all of our businesses (Upstream, Downstream and Chemicals) were temporarily released from their regular jobs to carry out this important assignment.

As described in its engagement letter (see appendix), the task force created by Total's Industrial Safety Department was assigned to:

“Understand why situations with a high risk potential still arise in our facilities and why there are still sometimes significant discrepancies between requirements¹ and actual practices.”

¹ Here, “requirement” refers to internal standards, rules and guidelines at Total units, not to requirements set by law.

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The engagement letter identified seven focus areas on which safety management systems are usually built:

- Risk analysis methods.
- Operations management.
- Maintenance and inspection practices.
- Contractor safety.
- Skills management.
- Internal audit effectiveness.
- Organization.

Each weeklong site tour followed the same program:

- An initial meeting with the facility's Management Committee, the Health, Safety and Working Conditions Committee (CHSCT), and, if requested, union representatives.
- An inspection conducted by five two-man teams in accordance with a schedule prepared in advance and based on frontline observations and interviews with employees.
- An oral report of the main findings to the facility's management team, the Health, Safety and Working Conditions Committee and the employees, once the inspection had been completed.

The Safety Inspection Task Force prepared a report for each site, recommending actions to be taken based on their observations during the inspection. The site-specific reports were then used to prepare this summary report, which addresses points applicable to all or most of the sites concerned.

The summary report is designed to be used by:

- All the sites in the task force's scope, even if all of the general recommendations do not necessarily apply to every site.
- All of our businesses, to identify avenues for improvement in industrial safety.

The summary report fulfils the requirements of the engagement letter by issuing a total of 58 general recommendations based on observations made at the inspected sites.

These recommendations aim to raise the safety standards for certain key processes and improve actual practices.

They should be considered as guidelines for strengthening existing action plans and setting priorities in the future.

Containing a wealth of valuable lessons that must be appreciated as a whole, the summary report reflects the complexity of our businesses and the difficulty of continuously improving safety performance.

When the Safety Inspection Task Force was set up, we undertook to communicate its findings to stakeholders, including employee representatives, the media and regulatory authorities. The summary report also serves this purpose.

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General Conclusions

To improve our safety performance, we need to clearly identify and eliminate the causes of accidents.

Root cause analyses show that accidents happen when several safety barriers — whether technical, organizational or human — fail. It is this complexity, combined with the technical nature of the oil and petrochemicals businesses, that makes it so difficult to maintain the highest industrial safety standards.

That is why the Safety Inspection Task Force looked at all the key processes affecting site operations. Based on onsite observations, a total of 58 clearly defined, practical recommendations have been made in the seven focus areas selected. This level of detail is critical in driving the improvements needed to ensure that our safety barriers remain effective at all times.

While the task force found that the sites concerned were operated soundly and their teams were highly professional, steps needed to be taken to ensure that this continues to be the case.

The foundation on which effective operations management is based is a set of technical standards, organizational procedures and operating rules that must be applied to the letter to avoid accidents.

The Safety Inspection Task Force reviewed the standards required by this set of rules and procedures and their application at the 13 sites inspected, which form a representative sample of Total's businesses.

The avenues for improvement are clear from the observations made:

- With regard to technical standards and plant condition, areas of improvement have been identified and are the subject of specific recommendations in the individual site reports. The recommendations cover, for example, safety systems for storage facilities and maintenance for offsites (facilities that support production). The necessary corrective measures will be undertaken as a matter of priority, as part of each unit's capital expenditure program.
- As our organizations have changed over time, organizational procedures have become so complex that safety management and its priorities sometimes get lost in the shuffle. We need to clarify the key processes affecting site operations — such as change management, risk analysis, feedback notices, work permits and making equipment safe for maintenance and repairs — and ensure that they are implemented with the requisite

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discipline. Verifying procedures must become a core element in safety management system (SMS) audits.

- Lastly, compliance with operating rules requires unflagging discipline. To maintain vigilance, we need to ensure the committed involvement of employees by providing them with ongoing training about their jobs and the associated hazards, by bringing them into the process of reviewing and updating the rules, and by taking into account the difficulties they encounter in the field, including the challenges faced by contractors working onsite. These are all critical factors in building a safety culture and must therefore be reinforced.

To ensure progress in all these areas, management needs to refocus its priorities on the front line, providing the leadership needed by its teams. It is on the front line that examples are set, failures to comply with rules are remedied, and operational discipline of the highest standard is maintained.

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The recommendations contained in both the site reports and the summary report aim to improve safety performance at all our units. The resources necessary to comply with these recommendations will be made available, and their correct implementation will be verified, reflecting the absolute priority we place on safe operations.

Safety Inspection Task Force Summary Report Observations and Recommendations

1. Risk Analysis Methods

To achieve a zero defect standard, technological risk management must be based on the rigorous application of methods that are continuously enhanced by experience.

The safety of our facilities depends on the effective management of our processes. Given that large quantities of flammable, explosive and sometimes toxic products are found on our sites, in high-temperature or high-pressure environments, the consequences of an accident can be very serious, even catastrophic.

It is therefore essential to ensure that the probability of an accident occurring is extremely low by doing everything we can to achieve a zero defect standard.

The professionalism of our teams, their production culture, the regulatory supervision of ICPE facilities — facilities deemed to pose a risk to the environment — and building and operating standards all help to keep the level of risk as low as possible.

Effective technological risk management must be supported by sophisticated risk analysis methods, rigorous management of safety systems, and the integration of lessons learned via feedback notices.

The regulatory requirements concerning technological risk management are transposed via a hazard identification survey, which is updated on a regular basis.

However, it is clear from the task force's observations at many of the inspected sites that although risk analyses are thorough and complex, they are often too specifically aimed at meeting regulatory requirements and are therefore not used effectively for operating purposes, such as taking into account smaller, internal risks, or for educational purposes, such as employee training.

If the analyses were used in this way, frontline employees would have better knowledge and understanding of the findings, such as accident scenarios and the consequences of the failure of the associated safety barriers (i.e. safety critical equipment).

In addition, the quality of the analyses could be further improved by the broader use of the hazard and operability (HAZOP) method, which effectively identifies process-related risks, and by stepping up supervision of the analyses by experts with the necessary experience and objectivity.

The process of providing feedback, whether about incidents that have occurred at the site (using event reports) or at other sites, has improved significantly and is now

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common practice. However, the lessons learned from such feedback need to be integrated more effectively.

Accordingly, the Safety Inspection Task Force makes the following recommendations:

In relation to risk analyses:

- Use risk analysis findings to improve the overall management of internal and external risks, by organizing emergency drills or more effectively managing safety critical equipment, for example.
- Maintain an appropriate mix of junior and senior engineers at each site to ensure an optimum level of skills and experience in process safety.
- Extend HAZOP studies across the board, starting with sites that present the highest risk and including offsites — facilities that support production, such as storage facilities and loading terminals.

In relation to managing temporarily disabled safety systems:

- The requirements for managing temporarily disabled safety systems must be standardized and more clearly defined, particularly for safety critical equipment, and must include the systematic identification of substitute measures.
- Stricter, more frequent checks must be carried out.
- Safety critical equipment must be more clearly identified.

In relation to feedback:

- Encourage the sites to more effectively leverage the lessons learned via feedback, by issuing a Group Safety Guideline to be adopted by all businesses.
- Manage the integration of feedback by sites more effectively.

2. Operations Management

When you are constantly made aware of the risks involved, embracing and strictly complying with operating rules becomes second nature.

The professional skills and attitude of our frontline teams guarantee the safe operation of our industrial facilities. Given the complexity of our businesses, it is important not to deviate from the general rules and specific procedures that are in place. Based on past experience and risk analyses, these rules and procedures are rigorous and require constant vigilance.

Avoiding complacency in the operation of our facilities is an ongoing battle.

Downgraded and unusual operating conditions must be identified and brought to the attention of the appropriate people so that a decision can be made about the steps to be taken.

However, it is clear from the task force's observations at many of the inspected sites that we need to emphasize the importance of complying with basic rules, especially with

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regard to wearing both standard and task-specific personal protective equipment (PPE), as appropriate. Management must set the example for employees, who must in turn set the example for contractors.

Continuously updating the many operating documents in which rules and procedures are defined is of utmost importance, and the inspected sites must make every effort in this area.

We also need to strengthen our management of technical and organizational changes, especially when they are deemed “minor.”

Lastly, in downgraded or unusual operating conditions, frontline managers have to be even more vigilant to ensure that these situations are handled with particular care.

Accordingly, the Safety Inspection Task Force makes the following recommendations:

In relation to personal protective equipment:

- Rules should be made clear at each facility and standardized across units.
- Action must be taken at all levels of management when the rules are not followed.
- Management must set the example with regard to compliance, by wearing personal protective equipment when appropriate and respecting local traffic regulations, for example.
- Employees must be disciplined about wearing appropriate personal protective equipment when necessary.

In relation to managing documentation:

- Clearly identify the most important safety documents (maps, procedures, safety device lists, etc.) and find the resources necessary at each site to update them and make them more user friendly.
- Make documents easily accessible to frontline employees and ensure that computerized document management systems are user friendly.
- Involve frontline employees in preparing and updating documentation.

In relation to change management:

- Reinforce change management requirements by issuing a Group Safety Guideline to be adopted by all businesses.
- Include organizational changes in this process.

In relation to identifying and managing hazardous situations:

- Train line production managers to more effectively recognize the situations and operations that require their presence in the field or additional resources.
- Prepare future line production managers via a period of shift work and a period of shadowing the day shift supervisor.

3. Maintenance and Inspection Practices

Works performed on our facilities require considerable preparation and coordination, adapted in line with the associated risks.

Inspections are carried out prior to maintenance to identify the ways in which our facilities might deteriorate, and ensure the integrity of our equipment on a technical standpoint.

The inspection departments at our plants have improved significantly in recent years. They have all obtained official recognition from the French Regional Environment, Development and Housing Directorate (DREAL) and their members are usually certified professionals. In addition, ahead of many of its peers, Total uses an inspection method based on identification of critical equipment.

However, it is clear from the task force's observations at many of the inspected sites that inspections focus mainly on ensuring compliance with regulatory requirements, whereas best practices should continue to be extended even to parts of the facilities that are not governed by pressure vessel regulations.

In addition, inspection teams are often not sufficiently involved in maintenance and operating processes. Communication needs to be improved by increasing opportunities for interaction.

More specific avenues for improvement have also been noted, such as leak repair system management and safety valve maintenance procedures.

Emergency maintenance is performed too often at certain sites, reflecting a poor level of prioritization. This puts unnecessary pressure on the teams involved and is prejudicial to the effective management of maintenance work.

The Safety Inspection Task Force also looked at the work permit process and made the following observations:

- When all the parties involved have not participated fully in the risk assessment process, the work permit does not provide a comprehensive list of the associated risks.
- When issued by a computerized system, safety recommendations are too general and sometimes not appropriate to the tasks to be carried out.
- A high degree of vigilance must be maintained with regard to particularly hazardous operations, such as work in confined spaces or at height, by using differentiated, more in-depth analyses.

Making equipment safe for maintenance or repairs varies from one site to the next, which can undermine the confidence of teams performing the work.

For routine maintenance, practices for checking compliance with specifications once the work is completed also vary greatly between sites. This can result in further work being necessary, which in turn increases the risks.

Accordingly, the Safety Inspection Task Force makes the following recommendations:

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In relation to inspection practices:

- Ensure regular communication between inspection, maintenance and operating teams so that the best technical monitoring methods and organization practices are shared widely for all equipment.

In relation to work permits:

- Maintain a high degree of vigilance in issuing instructions for particularly hazardous operations, such as work in confined spaces or at height.
- Ensure that the standard safety recommendations issued by the computerized system are tailored to the specific type of work to be performed.
- Remind the different people involved (operators, maintenance workers, safety officers and contractors) of their respective roles and responsibilities.
- Improve the prioritization process to ensure more effective scheduling of work to prevent emergencies.
- Do not tie specific maintenance work into routine maintenance work unnecessarily.

In relation to making equipment safe prior to maintenance work:

- Strengthen and standardize checks that equipment has been made safe and ensure, in particular, that the operator is present whenever a system containing potentially hazardous products needs to be opened.
- Improve operator training in the area of making equipment safe.

In relation to acceptance:

- Organize and strengthen procedures to ensure that the work performed complies with specifications, by setting priorities according to the issues identified.

4. Contractor Safety

Listening to contractors is a key factor in ensuring their safety and the quality of their work.

The efficient operation of our facilities frequently requires us to call on specialized service providers that have expertise in areas outside our scope.

The presence of contractors at our sites should never be taken lightly, as there is always a risk of interference between our activities and their work.

That is why work undertaken by contractors is governed by a multitude of regulations and very specific internal rules, and is supported in the field by practical measures designed to ensure maximum safety.

However, it is clear from the task force's observations at many of the inspected sites that it is important to go beyond simple compliance with regulatory and contractual requirements and pay closer attention to the quality of the work performed. Operations

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and maintenance specialists need to be present on the ground, not only to ensure that the relevant operating procedures and safety rules are applied, but also to check the quality of the work itself. This will also contribute to building a strong partnership with contractors.

We also need to facilitate reporting of deficiencies observed by contractors. Tracking these deficiencies is an effective way of improving safety performance, provided that corrective measures are taken by the facility concerned within a timeframe that is compatible with the critical nature of the deficiency. It also demonstrates responsiveness and transparency in our relationships with service providers, who must be encouraged to report any difficulties encountered while performing their work. This will help us to more effectively define safety rules and identify any additional training needs.

Accordingly, the Safety Inspection Task Force makes the following recommendations:

In relation to contract management:

- Change the way we monitor contractual obligations to ensure less paper-based verification and more field checks to ensure the quality of the work performed.
- Regularly assess the quality of contract work and the conditions in which it was undertaken, with input from maintenance, operations, procurement and safety, as part of a solid partnership with contractors.

In relation to feedback from contractors:

- Ensure that safety rules are appropriate to service provider activities, and provide additional training when necessary.
- Make sure that contractors who report deficiencies or difficulties are not penalized.
- Promote communication with contractors, track the deficiencies reported by them, take corrective action and develop a specific indicator.

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5. Skills Management

All our employees must be trained, experienced and involved in accident prevention at their particular level to ensure a safe workplace.

Operating industrial facilities is a complex task that requires the utmost professionalism from all the operating teams, whatever their field. Acquired through initial and refresher training and supported by experience, this professionalism is recognized as the cornerstone of our risk management strategy.

However, it is clear from the task force's observations at many of the inspected sites that, while our teams are well aware of the hazards associated with their equipment and facilities, they sometimes underestimate the risks for various reasons; for example, repetitive tasks can become routine and long-standing practices may present little-known risks.

Also, the desire to advance quickly within the organization, combined with an often-negative image of frontline positions, means that operator and manager turnover is high, which is detrimental to the acquisition of skills through experience.

In addition, managers — particularly those that work shifts — are too often judged on their technical skills alone. The ability to manage a team, and more particularly to develop and validate employees' skills, should also be taken into account.

Lastly, we need to emphasize the importance of training at various levels, from basic to advanced, as this enables all employees to develop their skills and to eventually become senior operators.

Accordingly, the Safety Inspection Task Force makes the following recommendations:

In relation to risk perception:

- Make employees aware of the serious consequences accidents can have and the potential risk to themselves.
- Provide employees with regular training on managing experience-based critical scenarios.
- Involve employees in analyzing safety critical tasks and updating documentation.

In relation to length of time in position:

- Slow down supervisor turnover and tailor career track criteria, for instance for high potentials, accordingly.
- Enhance the perception of field operator positions and have employees alternate frequently between field and control room work.
- Broaden employees' operating experience by having them participate in a major turnaround maintenance shutdown.

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In relation to supervisors' management skills:

- Emphasize the managerial aspect of shift chief operators and day shift managers, particularly the collective aspect of team management.
- Emphasize the role of chief operators in developing and validating their team members' skills, and train them to deal with downgraded operating conditions.

In relation to general training:

- Identify the basic knowledge and skills necessary for each position and check that they have been acquired.
- Verify the effectiveness of on-the-job training.

6. Internal Audit Effectiveness

The final stage in the implementation of any process is verification, which ensures that the process has been carried out effectively.

Given the complex nature of industrial facilities, the verification stage must be highly organized and its effectiveness must be measured. The general verification process is known as a management system, and the part dedicated specifically to safety is the safety management system (SMS).

In 2002, Total launched a campaign to audit the safety management systems at all of its industrial facilities presenting technological risks, as defined in the European Union's Seveso II Directive, to validate their implementation in accordance with internationally recognized criteria. The campaign, which concerned more than 400 facilities worldwide, was completed in late 2009.

However, it is clear from the task force's observations at many of the inspected sites that the importance placed on the method used to assess the SMS can lead to an emphasis on the overall rating rather than on effectively assessing the processes being audited.

In addition, performance improvements depend on the quality of our action plans, which often include too many actions without making priorities clear.

Lastly, the effectiveness of management systems and the quality of actions plans must be supported by indicators, which are the only useful way of gauging progress over the long term. These indicators are an important management tool that should be used more effectively.

Accordingly, the Safety Inspection Task Force makes the following recommendations:

In relation to safety management systems:

- Focus audits on key aspects of safety performance and ensure that they are correctly understood by the employees concerned.

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- Enhance external auditors' knowledge of our businesses.
- Prepare a practical guide to help facilities improve their management systems in line with Group Safety Guideline 11.

In relation to action plans:

- Prioritize actions in accordance with the resources available and their level of urgency.
- Monitor the effectiveness of actions right up to completion.

In relation to indicators:

- Include specific technological risk indicators in the facility's general scorecard.
- Rank the indicators used at each site so that they can be used as management tools.

7. Organization

Improvements in safety standards are driven by management. Management leadership and employee involvement are the foundations of a strong safety culture.

Our safety management systems provide a solid base for each facility to enhance its key risk management processes. Significant progress has been made in organizing our safety management systems.

The key word in the expression "management system" is "management," because managers determine the level of safety required and evaluate the results achieved.

Management's priorities include maintaining a presence in the field; identifying disparities between objectives and reality; listening to employees and employee representative organizations; and taking into account organizational difficulties.

However, it is clear from the task force's observations at many of the inspected sites that there is a natural tendency to grow accustomed to non-compliance with the basic rules. This results in lower safety standards, unclear manager attitudes and less willingness by employees to follow rules and recommendations.

This tolerance of non-compliance is always associated with managers not being sufficiently present in the field. Maintaining a strong presence in the field is the only way to motivate employees to embrace the rules and objectives, by nurturing the commitment of both individuals and teams.

It is vital to constantly emphasize the importance of complying with the rules, by taking action in accordance when deviations are observed and trying to understand their origin, whether technical, organizational or human.

Establishing effective dialogue with the Health, Safety and Working Conditions Committees (CHSCT) is critical in this regard.

Accordingly, the Safety Inspection Task Force makes the following recommendations:

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In relation to tolerance of non-compliance:

- Demonstrate rigor and discipline in demanding compliance with the basic rules, such as the Group-wide “golden rules,” and set the example in this regard.
- Encourage managers to speak up, to accept and leverage errors in order to improve, and to discipline non-compliance.
- Encourage frontline employees to report difficulties in applying the rules and procedures and get them more involved in the improvement process.

In relation to management’s presence in the field:

- Reaffirm management's key priorities, including the importance of safety in the field (job description, employee objectives, observing critical tasks).
- Limit internal and external demands on managers to facilitate their presence in the field.

In relation to the role of Health, Safety and Working Conditions Committees (CHSCT):

- Promote constructive dialogue with Health, Safety and Working Conditions Committees (CHSCT).
- Improve action plans following inspections by Health, Safety and Working Conditions Committees (CHSCT).

In relation to demands on certain positions:

- Identify the saturation points for certain management positions, streamline the workload accordingly (preparation for maintenance, for example) and allocate additional resources if necessary.

APPENDIXES

- Glossary
- Engagement Letter

Glossary

SMS	Safety management system
HAZOP	Hazard and operability study
ICPE	<i>Installations Classées pour la Protection de l'Environnement</i> , facilities deemed to pose a risk to the environment
DREAL	<i>Direction Régionale de l'Environnement, de l'Aménagement et du Logement</i> , the French Regional Environment, Development and Housing Directorate
CHSCT	<i>Comité d'Hygiène, de Sécurité et des Conditions de Travail</i> , Health, Safety and Working Conditions Committee
Golden rules	Set of basic safety rules for Group activities that are most likely to experience accidents

**Safety Inspection Task Force
Engagement Letter**

The Safety Inspection Task Force, also known by its French acronym IGS, has been set up to make observations and issue recommendations based on information gathered at the sites it inspects. The task force will therefore spend a significant amount of time listening to managers and employees, and will have in-depth discussions with the Health, Safety and Working Conditions Committee (CHSCT) at each site.

While safety-related topics are numerous, the task force's main objective is to understand the reason behind the disparities between our aim of achieving the highest safety standards and maintaining constant vigilance and the reality observed.

We need to understand why — despite senior management's strong leadership, our employees' commitment and dedication, the organizational, financial and human resources deployed, the measures taken and the safety action plans prepared in line with industry best practices — situations with a high risk potential still arise in our facilities and why there are still sometimes significant discrepancies between requirements and actual practices.

The topics that will be addressed by the task force include the following:

❖ **Organization**

- Appropriateness/effectiveness of the organizations in place
- Management of action plans and the related priorities
- Management's presence in the field

To assess the organization's effectiveness with regard to safety.

❖ **Audits**

- Scope of all audits (HSE and other) and regulatory inspections
- Use of International Safety Rating System (ISRS) audits
- Other forms of self-assessment

To assess the level of safety monitoring.

❖ **Risk analysis methods**

- Application of process risk analyses
- Evaluation of management of alternative measures implemented during temporary operating conditions
- Analysis of incidents/accidents and the feedback process

To assess the use of risk analysis methods.

❖ **Operations management**

- Compliance with procedures, identification of non-compliance with rules, reporting and related revisions
- Standardization of procedures, equipment, etc.
- Change management

To assess the discipline applied in managing operations.

❖ **Maintenance and inspection practices**

- Maintenance practices
- Technical inspection practices

To assess the effectiveness of maintenance and inspection practices.

❖ **Contractor safety**

- Conditions of outsourcing and vetting of contractors
- Employee training and certification
- Work conditions

To assess contractor safety performance.

❖ **Skills management**

- Employee training
- Turnover
- Skills maintenance and transfer

To assess skills management.