Assessment of the occupational risks in the workplace (multiplicative method)

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REVISION	DATE	PURPOSE	WRITTEN BY	CHECKED BY	APPROVED BY
01	17/06/2020	Update of GM-GR-HIS-008, taking account of ONE MAESTRO format.	PSR/HSE/FHOS/HI Thierry Barla Jean Pierre Bresson David Doyonnas Bart Geudens André Godart Emmanuelle Koscher Francesco Mency Nadine Medevielle Karine N'Damité Dirk Roosendans Christine Rousset Xavier Serisé Florent Thuillier Christophe Wagner	PSR/HSE/FHOS/HI Jean Michel COURANDIER	PSR/HSE/FHOS Ahmed ABZIZI

Foreword	This English version is translated from the original French reference version.

Contents

1 PURPOSE

Providing a method for assessing the occupational risks in the workplace. This method enables the drawing up of the assessment document for health and safety risks in the workplace, setting the priorities with regard to associated actions regarding the risks linked to health or safety or highlighting situations that require a more in-depth assessment.

This assessment is a source of support for:

- Hierarchical lines to improve general knowledge of the risks related to the activities and the employer.
- HSE contacts to implement the action plans required to eliminate or reduce identified risks;
- Health workers to set the necessary preventive measures;
- Services tasked with medical follow-ups to implement the adapted individual employee health surveillance program.

This methodology does not deal with the assessment of risks of major accidents or the risks for the environment. It does not address the assessment of risks from the perspective of “Work” as required to prepare a prevention plan or a work permit (in the event of co-activities).

This guide has no pretentions to be exhaustive. If in doubt, contact the industrial hygiene coordinators.

2 SCOPE OF APPLICATION

The recommended practices described in this guide and may be implemented by all Total entities[1] and subsidiaries[2], in accordance with their respective decision-making rules and without prejudice to any legislative and regulatory provisions that apply locally.

[1] Group "entity" refers to a Group branch, division, department, or other business segment (Local Business Unit).
[2] Group "affiliate" refers to a company in which TOTAL S.A. holds, directly or indirectly, most of the voting rights.

3 RATING METHOD FOR OCCUPATIONAL RISKS

Foreword: This guide provides a risk assessment method for risks to which people are exposed in the workplace in normal conditions and in subnormal conditions that can be reasonably anticipated.

1. The aim of this guide is to help the employer review the hazards present or likely to occur in or around the workplace, to identify their potential severity, to estimate their frequency and the exposure duration of persons, and to assess the probability of exposure or the occurrence of an undesirable event (incident or illness, exposure).
2. This assessment is different from the assessment that may be conducted as part of a prevention plan, the aim of which is to define the means of protection for a given worksite based on the hazards specific to it.

The first approach sets the prevention actions for the whole duration of work in the workplace, whereas the second sets the short-term protective actions for the work under consideration.

3.1 Setting up a taskforce

Any assessment of the risks in the workplace demands observation and analysis of the job in question and an in-depth discussion with the person or persons performing the tasks involved in the job.

To ensure it is as relevant as possible, the risks in the workplace analysis must be a multidisciplinary affair involving industrial hygiene, safety, the medical service, operational staff and any other experts deemed necessary.

3.2 Identification of the tasks

Each identified workplace is divided into successive tasks or potential exposure situations based on the products handled, the industrial processes, the organization of the work, the neighbouring activities and any other working conditions.

The tasks can be tackled step by step to make assessment easier. A number of matters are examined during this assessment. These include:

- The chain of operations;
- The circumstances in which tasks are performed (climate, interference with other tasks, activity of a third party close by, day/night, neighbouring plants, hazard families concerned etc.);
- The processes, equipment and products involved;
- Training (authorization) and information (instructions etc.) for those performing the task.

3.3 Identification of HEGs

The persons performing similar tasks (e.g. teams working in shifts) are classified in Homogeneous Exposure Groups (HEGs). There are four ways to compose HEGs:

- By job (position): a HEG is made up of all staff with similar tasks (recommended approach);
- By work zone: here the risk is assessed for all HEGs in a work zone characterized by the same risk (geographical notion);

- By process: here the risk is assessed for all HEGs following the same procedure or using the same equipment, regardless of location (production line notion);
- By chemical agent: here the risk is assessed for all HEGs of the entity using potentially high-risk chemical agents, regardless of location.

3.4 Risk assessment method

The assessment of the risk the HEG is exposed to depends on three parameters:

1. G: intrinsic severity of the hazard ;
2. F: frequency/duration of task involving exposure and ;
3. P: probability of potential exposure or probability of an undesired event occurring during the performance of the task.

   P depends on the conditions in which the task is performed/the situation in the workplace. When means/measures of prevention/protection are put in place, the probability of exposure is reduced by a reduction factor D.

The method entails estimating the risk before and after the means/measures of prevention/protection are put in place.

The risk is estimated by multiplying the ratings given for the parameters G, F and P:

Potential risk R: **R = G x F x P**

Residual risk R': **R' = G x F x (P - D)**

The potential risk R is characterized by the probability of exposure to the risk without means/measures of prevention/protection other than the intrinsic and permanent collective protective measures. The potential risk R does not take account of the (individual or collective) organizational risk reduction measures.

The residual risk R' is assessed after taking account of all prevention and protection measures.

If the means and measures put in place have had an impact on the frequency/duration of the task and the nature of the hazard (elimination/substitution of the hazard), G and F are reassessed. R' = G' x F' x P'. See paragraph 3.10.

3.5 Identification of the hazards and severity rating G

The hazards are classified in five hazard families:

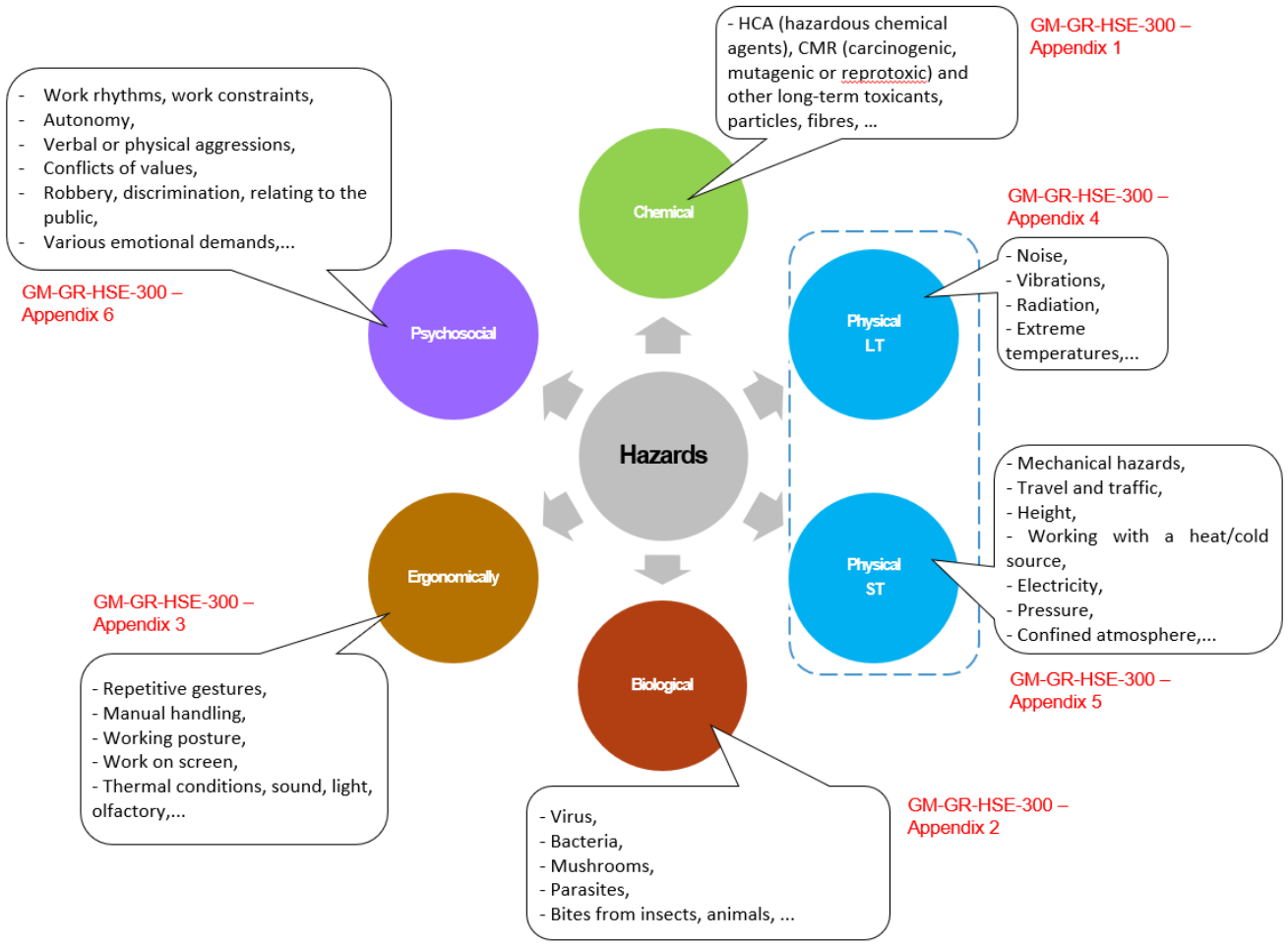


Diagram 1: The five hazard families.

An intrinsic severity scale G is attributed to each hazard. G does not change unless the hazard is substituted/eliminated.

There is a **severity matrix for each hazard family** (see the appendices to this guide, based on the type of hazard considered). The use of these matrices should be **prioritized**.

The matrices are based on the following logic:

Severity	Rating G	Chronic effects		Acute effects	
		Type of damage	**Examples of damage**	**Type of damage**	**Examples of damage**
Catastrophic 	**40***	Several fatalities		Several fatalities	Ebola-type epidemic
Major  	**15**	Fatality or permanent disability	Cancer, profound deafness	Fatality or permanent disability	Loss of the use of a limb
Serious 	**7**	Illness requiring a work stoppage but without permanent disability	Post traumatic stress, MSDs	Temporary incapacity for work.	Fracture, intoxication, second-degree burn, lumbago
Moderate 	**3**	Illness not requiring a work stoppage	Slight reduction in hearing ability	No incapacity for work but medical treatment, adapted work	Light sprain, spasm, cut with stitches, first-degree burn
Minor 	**1**	Symptoms not requiring outside care, localized discomfort	Irritation Light muscle or joint pain Eyestrain	First aid	Pain, discomfort, irritation or wound that only requires first aid

Table 1: Hazard rating.

* Line cannot be used to assess the individual risk at the workplace except in specific cases. See the table of annexes in this guide.

Supplementary information on risks and hazards is provided in the guides GM-GR-HSE-400 to 407.

3.6 Identification of exposure situations

All the factors likely to affect the health and safety of employees should be identified for each workplace task (products, organisms, objects, situations or activities, ...). The involvement of operational staff is therefore essential.

The identification of the hazards by task is based on normal operation (including restart, maintenance and shutdown) or reasonably anticipated downgraded operation. For example, the temporary low-grade malfunction of a machine or a process ahead of corrective maintenance.

The analysis of the risks in the workplace entails studying the conditions of exposure of staff to the hazards present during each task. It draws on:

- The description of the tasks as planned;
- The observation of the actual work performed;
- The interview with the operators on their working conditions at the workplace;
- The structured feedback following accidents and incidents occurring in connection with the activity in the workplace (or equivalent activity outside);
- Any meteorological readings taken in the workplace;
- The recommendations from audits.

In this step, the analysis takes account of the context in which each task is performed:

- The chain of tasks;
- The interface with other tasks;
- The circumstances and conditions in which the task is performed;
- The processes and equipment involved;
- The examination of the installations, places, circumstances and arrangements of any exposure;
- An examination of the procedures and working conditions to determine the circumstances of exposure (duration, frequency, quantity, etc.);
- A check of whether metrology data is available in the archive.

3.7 Rating of the exposure frequency and duration F

The proportion of the working time the HEG is exposed to a hazard is calculated on the basis of the average duration of the task and the frequency with which the task involving exposure to the hazard considered is performed.

The duration “d” and the frequency “f” of the task must be taken into account to calculate the rating factor F (d x f) for a chronic exposure:

Rating F	Frequency (f) and duration (d) of the task as % of working time	Day	Week	Month	Year
0.5	**< 0.5%**	t < 2.4 mins	t < 12 mins	t < 48 mins	t < 8.5 hrs
1	**0.5-5%**	2.4 mins ≤ t < 24 mins	12 mins ≤ t < 2 hrs	48 mins ≤ t < 8 hrs	8.5 hrs ≤ t < 85 hrs
2	**5-20%**	24 mins ≤ t < 1.6 hrs	2 hrs ≤ t < 8 hrs	8 hrs ≤ t < 32 hrs	85 hrs ≤ t < 340 hrs
3	**20-50%**	1.6 hrs ≤ t < 4 hrs	8 hrs ≤ t < 20 hrs	32 hrs ≤ t < 80 hrs	340 hrs ≤ t < 850 hrs
6	**50-75%**	4 hrs ≤ t < 6 hrs	20 hrs ≤ t < 30 hrs	80 hrs ≤ t < 120 hrs	850 hrs ≤ t < 1275 hrs
10	**> 75%**	t ≥ 6 hrs	t ≥ 3.75 days	t ≥ 15 days	t ≥ 1275 hrs

Table 2: Rating of the frequency f and the duration d

Note: The calculation to establish the duration of the task per day, week, month or year as a percentage of the whole working time is based on the 8-hour day (equivalent to an average workplace), Week = 40 hours, 160 hours per month and 1700 per year.

If a task is repeated several times over a reference period, the duration for this reference period is obtained by multiplying the duration of the individual task by the number of times it has been performed during this period.

Example:

A two-hour task (d) performed every day for a month, once a year (f) corresponds to 40 hours per year (d x f), so the reference column of the rating is “Year” and the result is: F = 3.

3.8 Potential exposure probability rating P

The probability of potential exposure takes account of the intrinsic and collective (fixed and permanent) protection from the hazard considered. It does not take account of PPE and organizational measures.

The potential probability can be addressed in two ways:

1. Potential exposure probability: this is adapted to assess the chronic risks.

   Unlike the severity matrix, the probability is based on the causes (e.g. working in a noisy environment, using a ladder) rather than the consequences (first aid or fatality).

The opinion of the expert (HSE, occupational physician, operator): this takes account, among other things, of the volatility of the product, the possibility of contact with the product, the quantity of the product, the grain size of the product (for solids), the proximity of contact with an energy source, contact with a source of biological contamination, the design of the workplace, the direct observation of the task, the coexistence of several ergonomic risk factors, etc.

OR

2. Probability of an undesired event occurring during the performance of the task: it is adapted to assess the acute risks.

   The databases listing accidents/incidents and the associated medical care or other events on site/in the entity/Group/profession/world constitute a useful source for this assessment.

   This should only be used if the statistical base is big enough, as the lack of an incident does not mean the risk is non-existent or vice versa. A single isolated incident does not equate to a high risk (it simply reflects the existence of the risk).

   Take care to distinguish between the results of the frequency/duration of the task and the results of the probability that an undesirable event will occur during this time.

The matrix above (Table 3) gives an indication of the probability classification. The probability of each hazard is classified more precisely in the appendices 1 to 7. The use of these matrices should be **prioritized**.

Rating P	Probability of potential exposure to a hazard that can have chronic effects	Potential probability of the occurrence of an undesirable event (UEE) (acute effect)
10	**Foreseeable exposure** (In contact with the hazard)	**Near-accident situation** ~ 1 UEE 1 time in 2 when the task is performed
6	**Exposure entirely possible**	~ 1 UEE every 10 tasks
3	**Exposure unusual, uncommon**	~ 1 UEE every 100 tasks
1	**Exposure rare**	~ 1 undesirable event every 1000 tasks (~ 1 UEE observed on large site in five years)
0.5	**Exposure conceivable but improbable**	No UEE, observed on the site but observed in the Group
0.2	**Exposure practically impossible**	No UEE, observed on the site but observed in the profession
0.1	**Exposure impossible**	No UEE has ever been observed in the profession

Table 3: Potential probability rating P

Examples of an undesirable event:

The fall risk is:

- Foreseeable (P = 10), if the ladder is completely frozen in winter;
- Entirely possible (P = 6), if the ladder is considered hazardous;
- Uncommon, but possible (P = 3), if falls have been recorded in the past;
- Rare but possible (P = 1), if the ladder is in perfect condition;

- Conceivable but improbable (P = 0.5), if the ladder is in perfect condition and is regularly checked.

The risk of a leak at a small tap is:

- Entirely possible (P = 6) or foreseeable (P = 10) in the opinion of the operator's or maintenance staff, if it is known that the tap dates from the earliest days of the plant (30 years), that there have been few or no inspections, that it is highly corroded and that small leaks have been observed in the recent past;
- Rare but possible event (P = 1), if the tap is new and done in accordance with the most recent standards, regularly checked and not exposed to external stresses.

Choose the most realistic potential probability, not the worst-case scenario.

3.9 Rating of the reduction D based on the means/measures of protection/prevention in place

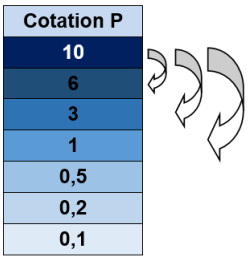
The existing means/measures of prevention/protection (Mp) should be reviewed:

- Collective protective equipment (CPE)
- Organizational measures (procedures, operating methods/labels/posters, staff training/information, work times), detection systems
- Personal protective equipment (PPE)
- and the residual probability P' calculated, taking account of these means and measures of risk protection/prevention.

P' = P – D (the reduction D is expressed at probability level)

(the matrix comprises seven levels)

Example:



If P = 10, then:

- with a reduction of 1 level, P' = 6;
- with a reduction of 2 levels, P' = 3;
- with a reduction of 3 levels, P' = 1.

Reduction D of the probability by level of P	Means/measures of prevention/protection type (Mp type)
0	**No means/measures of prevention/protection in place** OEL or AV (action value) exceeded.
-1	**At least two procedural or organizational measures from:** - Organizational measures (breaks, shifts, restricted access) - Operating modes - Training - Labelling, posters, signage, marking, signposting, detection systems - PPE (personal protective equipment) adapted to the exposure route - Adapted medical surveillance OR **Use of PPE with training covering the following topics:** - How to select the PPE to ensure it is adapted to the employee - Understanding the limits of its use - Knowing how to put it on, take it up and when it changes - Knowing how to clean and store it AND checks of proper PPE use by the hierarchy
-2	**Technical adaptation of the workplace to significantly reduce the risks:** - Collective protection equipment
-3	**Technical adaptation of the workplace to completely eliminate or drastically reduce the risks:** - Containment of the risk - Fixed collective protection equipment that reduces the risk to a negligible level.

Table 4: Rating of the reduction D based on the means/measures of protection/prevention in place

There is a **residual probability P' matrix for each hazard type.** They give examples of complementary or specific Mps. The use of these matrices should be prioritized. See annexes.

3.10 Calculation of the residual risk R'

The calculation of the residual risk takes account of the risk reduction measures in place. The calculation is based on the following equation:

R' = G x F x P'
where **P' = P - D**

If the means and measures put in place have had an impact on the frequency/duration of the task and the nature of the hazard (elimination/substitution of the hazard), G and F are reassessed. R' = G' x F' x P'.

It can be difficult to quantify the risk reduction measures by taking account of all work situations. The rating can be estimated on the basis of the combination of criteria corresponding to the situation

analyzed. Upon the completion of the analysis, if the previous residual risk value has to be adjusted to take account of an expert opinion, this adjustment must be documented in the Workplace Risk Assessment Document.

If no precise conclusions can be drawn about the risk level on the basis of the assessment, the exposure level should be assessed on the basis of the measurement.

The guides GM-GR-HSE-400 (chemical agents), GM-GR-HSE-401 (noise) and GM-GR-HSE-402 (radiation) set out the methodology for exposure measuring campaigns with regard to these hazards.

3.11 Hierarchy of the risk and definition of low risk

At the end of the assessment, the risks are classified to set the priority actions to be taken based on the following table:

Classification of the residual risk R'	Type of action to be taken	Value R'
High risk	**Immediate compensatory actions or measures** The work is not started or continued as the risk has not been reduced or complementary measures have not been conducted.	**R' > 400**
Significant risk	**Urgent improvement is required** Considerable means have been put in place to reduce the risk within a short space of time	**200 < R' ≤ 400**
Average risk	**Improvement is necessary** Risk reduction measures have been implemented within a set period	**70 < R' ≤ 200**
Low risk	**Special attention is necessary** Solutions that offer a favourable cost-benefit ratio are examined	**20 < R' ≤ 70**
Very low risk	**No specific actions** Review periodically to make sure that the conditions have not been altered	**R' ≤ 20**

Table 5: Classification of the residual risk R'.

As soon as the residual risk is "high", corrective actions are taken to reduce the risk level to an ALARP level. After taking the necessary actions, a new assessment is scheduled to ensure the risks are significantly reduced or eliminated.

3.12 Action plans

The action type is based on the value of the residual risk (R') associated with the task. They reduce:

- the probability of the hazard materializing or
- the exposure to the hazard or
- the consequences of exposure.

A coherent action plan must be created and followed up when the risks are not "low" (R' >70).

To reduce the residual risk, the entity may:

a. act at the source to eliminate or reduce the hazard (substitution of the product, reduction of quantities, adaptation of the task), if the hazard is substituted, both G and the potential risk varies;

b. implement technical risk reduction measures (collective protection equipment: vapor extraction, secure access…);

c. implement organizational or individual measures (operating methods, control procedures, PPE, training…). The residual risk has been reduced, the potential risk remains the same.

Note: Organizational and individual measures must be effective and must be maintained. If they are not implemented correctly and if the potential risk is greater than or equal to a set risk value, the task is said to be "critical". These tasks demand a special communication to staff. They are studied in depth and verified regularly to ensure they remain effective.

The task must be reassessed after the implementation of risk reduction measures. This reassessment takes account of the supplementary measures.

Even if the risk level is deemed to be under control, regular actions will be scheduled to check the stability of the situation.

The advancement of the action plans is checked in accordance with the schedule that has been set. The action plan must be checked at least annually.

Note: The "final" risk is the value of the residual risk after the iterative risk reduction measures have been taken.

3.13 Writing the Workplace Risk Assessment Document

The risk assessment is formalized in a Workplace Risk Assessment Document following all the above steps. A model is provided in section 3.13.3.

All proofs of actions that improve the result of the risk assessment (explanations of decisions, metrology results; ...) should be appended or quoted.

Staff can access a paper or digital version of this document. It is also available for audits.

3.13.1 Staff of external companies working on sites operated by the Group

Each employer must conduct a risk assessment of its employees' workplaces.

To this end, the requisite information about the workplaces used by their staff, incorporating the specific risks associated with our activities, should be shared with external companies who work on site.

Examples: share the list of products and their SDS/NIP, the noise/radiation/other exposure levels, the assessment of the HEG in question.

3.13.2 Reviewing the Workplace Risk Assessment Document

1 - Periodic review

The occupational risk assessment is reviewed in accordance with the local regulations or a schedule established by the entity. This schedule must enable the effectiveness of the implemented actions to be monitored.

2 - Review based on the working conditions

The occupational risk assessment is updated without waiting for the periodic review in the following cases:

- A major change to the work conditions, including technical and organizational changes;
- A significant change to the products manufactured or used;
- The introduction of a new product classified as hazardous;
- A significant change to the processes (new or changed installation);
- A significant change to the tasks (duration, frequency, means);
- Following an accident (unidentified risk, underestimated probability) or an occupational illness;
- Following internal feedback (subsidiary, management, discipline, business, Group) or external feedback (profession): health or safety event, occupational illness;
- New knowledge about the hazards;
- Remarks from the service responsible for medical supervision or audits;
- Significant changes to regulations, etc.

The hazard identification and risk assessment processes are started up at the design stage of a new installation, product or service.

3.13.3 Formalizing the Workplace Risk Assessment Document

Tasks	Sub-tasks	Hazard type	Hazard situation	Consequences	Duration and frequency	G	F	P	Risk Rp	Means/measures of prevention/protection	G'	F'	P'	Risk Rr
T1	Step 1	Chemical	Contact with...	Allergy, cancer	2h/d for 1m/y	15	1	10	150	CMR handling, nitrile gloves with cuff, change in conditioning...	15	1	3	45
			Inhalation of…											
		Biological												
		Ergonomic												
		Physical												
		Psychosocial												
	Step n	Etc.												
Tn														

Table 6: Model Workplace Risk Assessment Document.

4 DOCUMENTATION AND ARCHIVING

The various versions of the Workplace Risk Assessment Document are archived for 50 years with all necessary proofs.

A copy (or summary) is sent to the service responsible for medical supervision and the heads of departments concerned.

5 PERFORMANCE MEASUREMENT

Indicators are used to monitor the performance of the risk assessment process. For example:

Indicator 1: Conducting workplace risk assessments

Percentage of HEGs or workplaces for which a risk assessment has been conducted.

Indicator 2: Sharing of the data with the health professional responsible for medical supervision

Percentage of entities that share the results of the risk assessment and exposure measurements with the health professional responsible for medical supervision

6 TERMS AND DEFINITIONS

Accident

Any sudden, dated undesirable event that causes injury or illness, damage to property or installations, a production loss, environmental damage or damage to the Group's image.

HCA

Hazardous chemical agent

(*) ALARP (as low as reasonably practical)

Critical

In the HSE context, characteristic of equipment, a product, situation, process, task or operation, likely to cause significant injury to people, damage to the environment and/or property.

Hazard

Intrinsic property of a product, equipment, process situation or action that can lead to injury to people, damage to the environment and/or property.

Acute effects (short term)

Result of accidental or short-term high-level exposure: accident notion However, the health effects can differ slightly in time (~ day). Examples: acute toxicity linked to exposure to a chemical agent; acute back problems linked to the handling of loads, etc.

UEE

Undesirable event or exposure.

PPE

Personal protective equipment

Health event

Undesirable event that can affect the health of staff (exposure event, occupational illness, epidemic, post-traumatic stress, foodborne illness, radiation).

Experts

Operators, task observers, health professional, internal or external HSE, employee representatives, health and safety committees, radiation hygiene expert...

Occupational exposure

Being in the vicinity of a (chemical, physical, biological, ergonomic, psychosocial) hazard as part of an occupational activity.

Absence of occupational exposure

Exposure does not exceed the usual level in the general population of the country in which the operating entity is located, deemed an absence of occupational exposure. Proof must be provided.

Frequency and duration of the task entailing potential exposure (F)

The frequency takes account of the number of times the task is conducted and the duration a person is potentially exposed to the hazards identified.

Severity

Categorization of an actual or potential consequence associated with exposure to a hazard, using the Group risk matrix. The severity level of an event is the highest level measured in the assessment, using one of the approved risk matrix consequence grids: human, environment, equipment/production and media.

In Industrial Hygiene, the severity of the hazards is determined on the basis of their known effects on human health; it is the level of potential health consequences of a chemical, biological, physical, ergonomic or psychosocial hazard apart from all prevention and protection measures.

SDS

Safety data sheets

Homogeneous Exposure Group (HEG)

Group of people with a similar exposure level based on the tasks they perform, the frequency of these tasks and the conditions in which these tasks are performed.

Occupational illness

Illness directly or primarily caused by work-related factors. It is caused by exposure to chemical, physical, biological, ergonomic or psychosocial risks. There is a scientifically proven link between the cause and the illness.

Risk reduction measure or means/measures of prevention/protection (Mp)

Action and/or measure taken as new obstacle to reduce the frequency or negative consequences of the associated risks.

Mp type

Means/measures of prevention/protection type These are defined in paragraph 3.9 “Calculation of residual risk R’”.

Action plans

Action or set of actions with one or more designated persons and a scheduled completion date in response to a specific result (e.g. audit observation, incident survey).

Probability of the occurrence of undesirable exposure

Probability in percentage form that the exposure will occur while the task is being performed, based on the existing protection, type of procedure, how the task is performed etc.

Risk

Combination of the probability that a hazardous event will occur and the severity of the impact the hazard exposure could have.

Chronic risk

Risk resulting from the combination of low repeated exposure over time to a chemical, physical, biological, ergonomic or psychosocial risk with an imperceptible medium- or long-term impact during exposure.

Potential risk

Probability that the potential of inconvenience is reached in the exposure conditions. These conditions take account of the (fixed and permanent) intrinsic and collective protection. The notion of potential risk is used to identify critical tasks.

Residual risk

Risk that remains after all measures to reduce identified risks have been taken.

Critical task

Task that can lead to significant injury to people or damage to products, property, installations or the environment if it is not performed or it is performed incorrectly.

Traceability of exposure

Collection, conservation and distribution of collective and individual data on the health hazards at workplaces and the conditions of exposure to the hazards of a physical, chemical, biological, psychosocial or ergonomic nature at the workplace.

7 REFERENCE DOCUMENTS

Reference	Title - Group documents
CR-GR-HSE-405	Industrial hygiene
GM-GR-HSE-400	Measuring exposure to chemical agents
GM-GR-HSE-401	Preventing risks associated with noise in the workplace
GM-GR-HSE-402	Radiation hygiene
GM-GR-HSE-403	Preventing risks associated with asbestos and CMR refractory ceramic fiber
GM-GR-HSE-404	Preventing ergonomic risks associated with monitor work
GM-GR-HSE-405	Traceability of industrial hygiene and health information
GM-GR-HSE-407	Hygiene in living and dining spaces
GM-GR-RH-005	Preventing and treating post-traumatic stress
GM-GR-DJ-001	Definition of notion of operational domain

8 BIBLIOGRAPHY

ISO 45001:2018 - Occupational health and safety management systems — Requirements with guidance for use.

9 LIST OF APPENDICES AND SUPPLEMENTARY DOCUMENTS

Reference	Title
Appendix 1	Assessment of the occupational risks in the workplace (multiplicative method): chemical risk
Appendix 2	Assessment of the occupational risks in the workplace (multiplicative method): biological risk
Appendix 3	Assessment of the occupational risks in the workplace (multiplicative method): ergonomic risk
Appendix 4	Assessment of the occupational risks in the workplace (multiplicative method): long-term physical (health) risk
Appendix 5	Assessment of the occupational risks in the workplace (multiplicative method): short-term physical (security) risk
Appendix 6	Assessment of the occupational risks in the workplace (multiplicative method): risks associated with psychosocial factors

10 DISTRIBUTION ARRANGEMENTS

Publication in REFLEX (Group document depository).

11 VERSIONS

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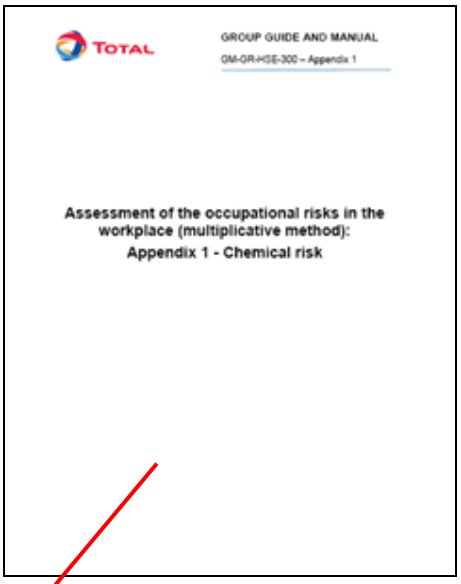
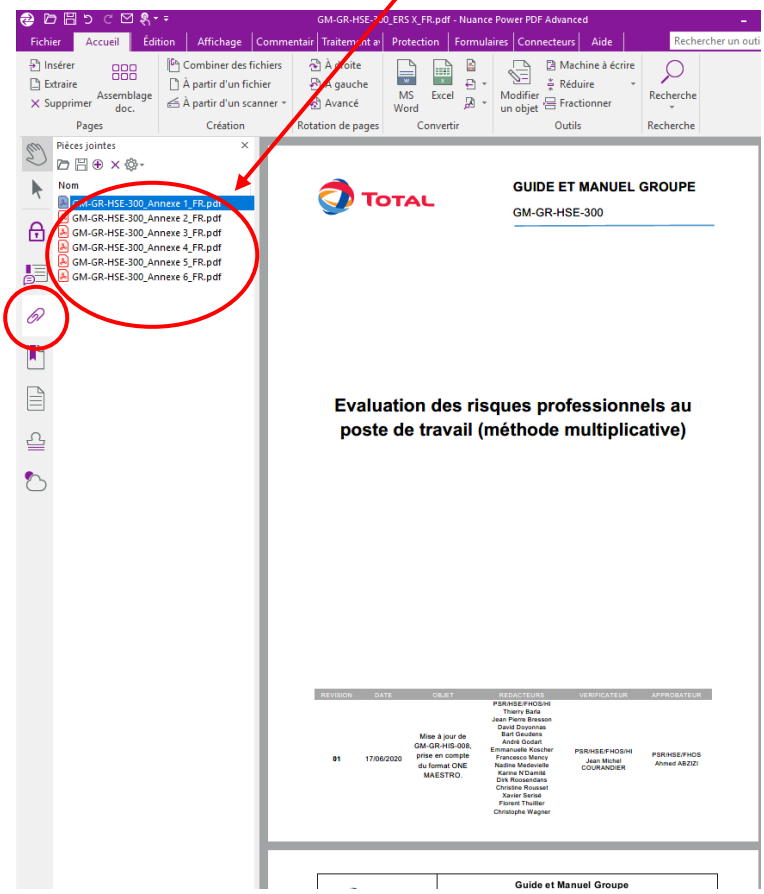
01	17/06/2020	Update of GM-GR-HIS-008.	PSR/HSE/FHOS/HI Thierry Barla Jean Pierre Bresson David Doyonnas Bart Geudens André Godart Emmanuelle Koscher Francesco Mency Nadine Medevielle Karine N'Damité Dirk Roosendans Christine Rousset Xavier Serisé Florent Thuillier Christophe Wagner	PSR/HSE/FHOS/HI Jean Michel COURANDIER	PSR/HSE/FHOS Ahmed ABZIZI
00	January 2012	Creation of GM-GR-HIS-008	José-Javier Alonso-Aguado with: Nicolas Clerc Paul De Bruyn Etienne De Poli Bart Geudens Christian Guenzi David Hoff Frédéric Pidoux Dirk Roosendans Sébastien Roulier Myriam Saadouni Danny Smet	-	-

APPENDIX 1

Assessment of the occupational risks in the workplace (multiplicative method): chemical risk

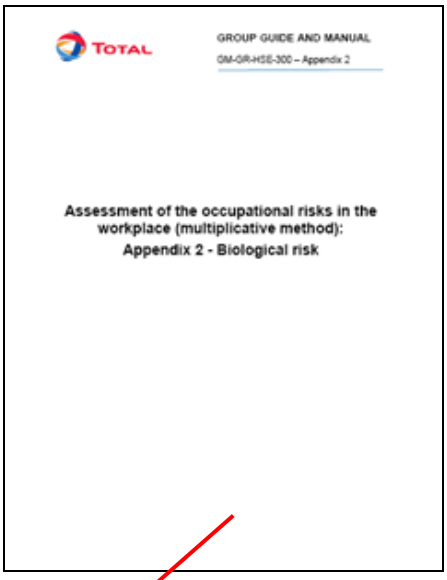


Voir fichiers joints à ce guide

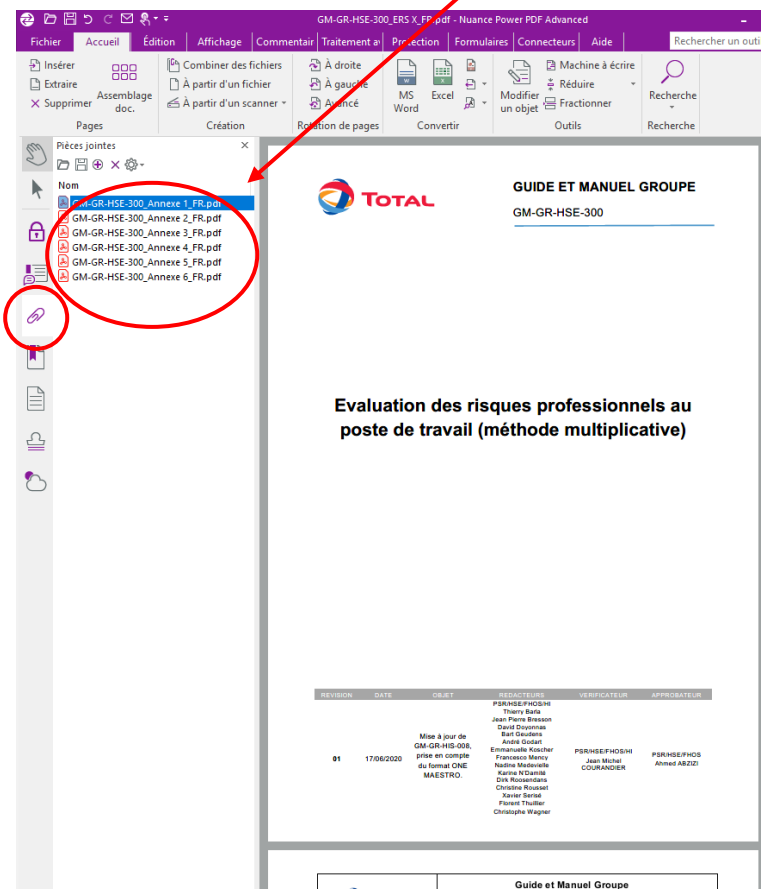


APPENDIX 2

Assessment of the occupational risks in the workplace (multiplicative method): biological risk

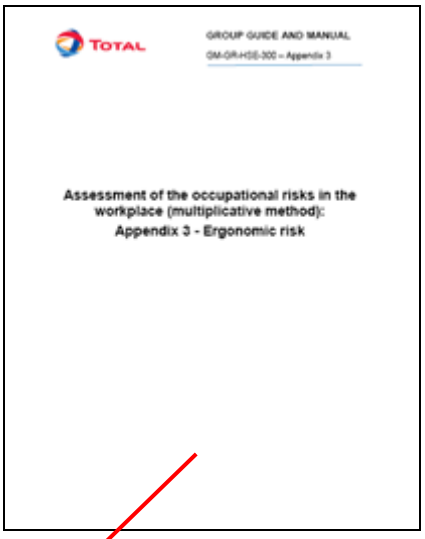


Voir fichiers joints à ce guide

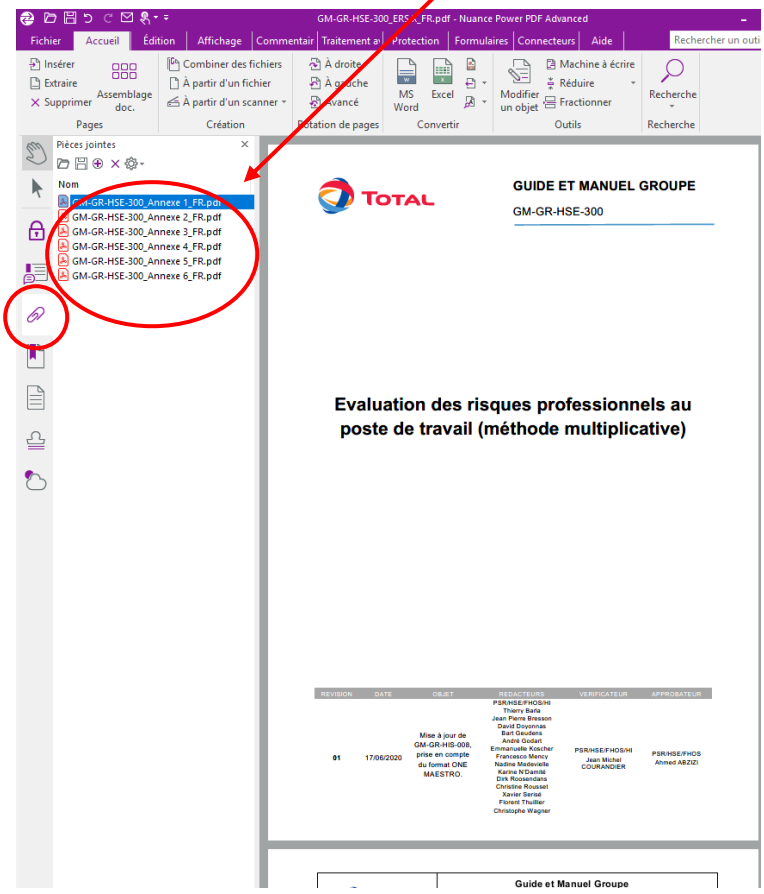


APPENDIX 3

Assessment of the occupational risks in the workplace (multiplicative method): ergonomic risk

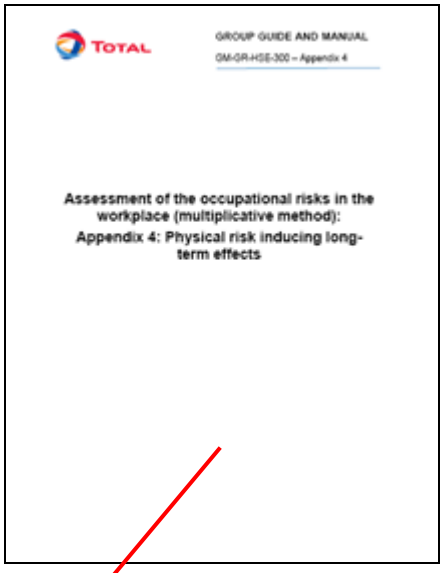


Voir fichiers joints à ce guide



APPENDIX 4

Assessment of the occupational risks in the workplace (multiplicative method): long-term physical (health) risk


TOTAL

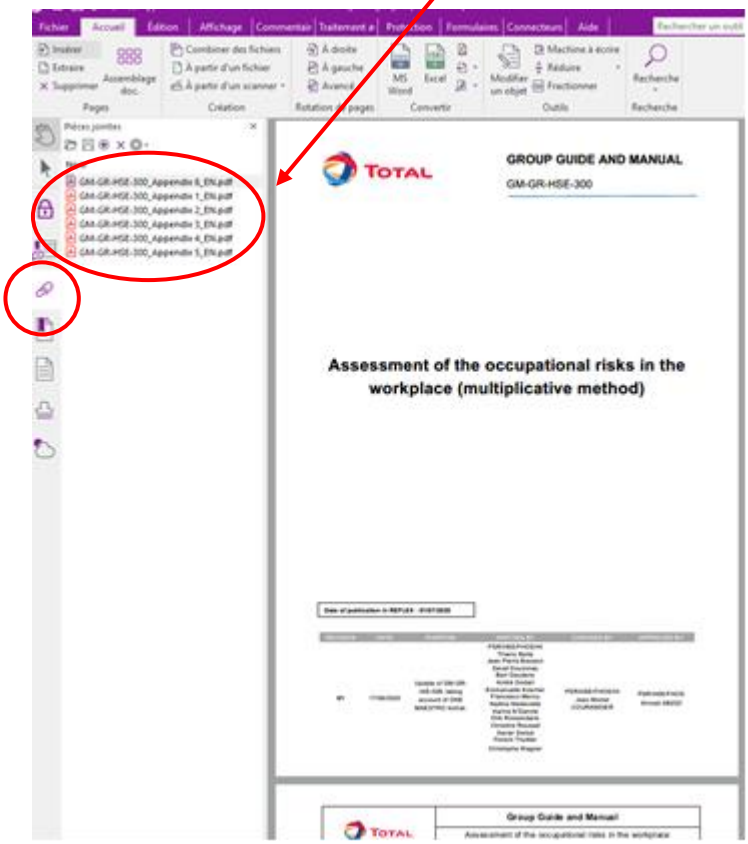
GROUP GUIDE AND MANUAL

GM-GR-HSE-300 – Appendix 4

Assessment of the occupational risks in the workplace (multiplicative method):

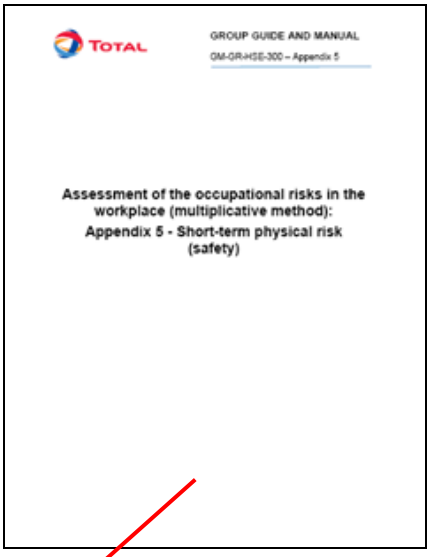
Appendix 4: Physical risk inducing long-term effects

See file appended to this guide



APPENDIX 5

Assessment of the occupational risks in the workplace (multiplicative method): short-term physical (security) risk



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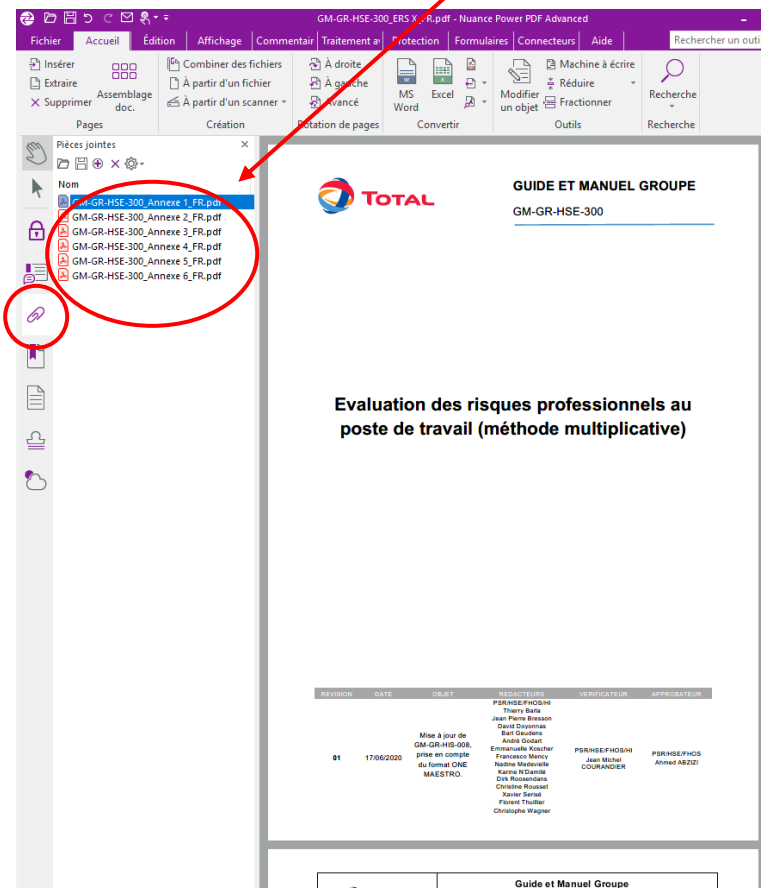
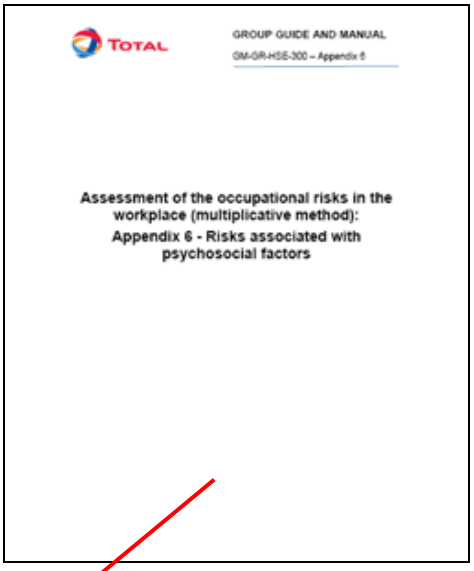


APPENDIX 6

Assessment of the occupational risks in the workplace (multiplicative method): risks associated with psychosocial factors



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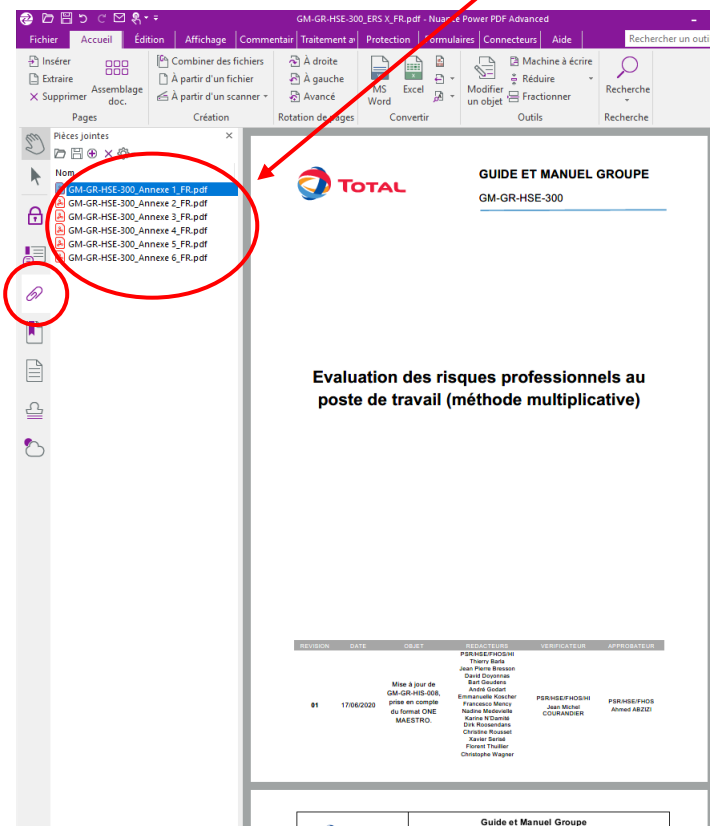

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Original signed