Synergie / PARI Maintenance
A risk assessment tool for maintenance

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A safety & health training tool in maintenance for learners
What is Synergie Maintenance?

- Synergie Maintenance is an educational program dealing with safety and health at work for learners (pupils, students, apprentices) in the field of maintenance.

- This program results from a 3 parties partnership:
  - the educational establishments
  - the professional organizations and association
  - the prevention network of French social security

with a common and shared concern regarding safety and health issues during maintenance operations.
Program objectives

Improve the training of learners in the Maintenance educational pathway by contributing to the acquisition of knowledges and skills regarding safety & health at work by the implementation of a prevention approach on real maintenance working situations in the enterprise.
Implementation

- During his probationary periods, the learner has to make a diagnosis of occupational risks
- After a training course at school and by the means of Synergie Maintenance tool, he should be able:
  - to follow a methodology to structure his thinkings and his observations during the maintenance operations
  - to identify and memorize the various hazards within a working situation
  - to define the preventive and the protective measures in order to operate in safe conditions
A tool for the enterprise to assess the risks in maintenance
1st step: risk analysis

2nd step: risk evaluation

Safe workplace?

- yes
- no

3rd step: elimination or réduction of risk

Overall approach

Occupational risk assessment update ('document unique')

Iterative process to reach safety

Synergie maintenance approach is based on ISO 12100 standard
Objectives

By applying a risk control approach, PARI Maintenance software provides the maintenance worker with an analytical tool that allows:

1. to define the maintenance working situation and its limits
2. to identify the hazards and the dangerous situations he is likely to face within this working situation
3. to describe the risks associated with each identified hazard
4. to define the measures to eliminate the hazards or to reduce the related risks
Hazard identification

Tasks to be done

Working Situation

Operations

Conditions of intervention

Stress, tiredness, poor experience, ..

Not updated documentation, misidentified equipments

Organization

Machinery

Products

Environment

Energies

Aggressive shapes

Presence of Hazards!

Dangerous characteristics

Dangerous atmosphere

Congested, slippery or damaged ground

Tooling

Agressive shapes

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### Catégories de dangers définis dans le logiciel

#### Dangers liés à l’équipement et à son environnement

<table>
<thead>
<tr>
<th>Sous-famille</th>
<th>Pictogramme associé</th>
<th>Dangers</th>
</tr>
</thead>
</table>
| Energies           |                     | - Énergies d'alimentation  
                    |                     |  [électricité, fluide sous pression]                                   |
|                    |                     | - Énergies de transformation  
                    |                     |  [énergie cinétique, thermique]                                        |
|                    |                     | - Énergies enregistrées par le produit                                  |
| Ambiances          |                     | - Atmosphérique  [gaz, aérosol, vapeur, poussières]                     |
|                    |                     | - Sonore                                                                |
|                    |                     | - Lumineuse                                                             |
|                    |                     | - Thermique                                                             |
|                    |                     | - Vibrations                                                           |
|                    |                     | - Rayonnement                                                          |
| Circulations et accès |                 | - État et encombrement des sols                                         |
|                    |                     | - Différentiels de niveaux                                              |
| Produits           |                     | - Produits dangereux utilisés ou produits                               |
|                    |                     |  par l'équipement                                                      |
|                    |                     | - Produits dangereux stockés dans l'environnement                       |
| Formes             |                     | - Surfaces et arêtes agressives                                         |

#### Dangers liés à l'intervention

<table>
<thead>
<tr>
<th>Sous-famille</th>
<th>Pictogramme associé</th>
<th>Dangers</th>
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</thead>
<tbody>
<tr>
<td>Organisation</td>
<td></td>
<td>- Absence ou défaut de procédure</td>
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<tr>
<td></td>
<td></td>
<td>- Absence ou défaut d'identification</td>
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<td></td>
<td></td>
<td>- Absence ou défaut de documentation</td>
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<tr>
<td>Conditions de l'intervention</td>
<td></td>
<td>- Travail en hauteur</td>
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<td>- Travail dans une zone exigüe</td>
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<td>- Travail dans un espace confiné</td>
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<td>- Travail impliquant des postures inconfortables</td>
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<td>- Travail nécessitant des tenues spécifiques</td>
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<td>- Travail en présence de tension</td>
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<td>- Travail avec sécurité restreinte</td>
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<td>- Travail isolé</td>
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<td>- Travail sur circuit sous pression</td>
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<td>- Travail sur installations contenant des produits dangereux</td>
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<td></td>
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<td>- Travail avec déplacement routier</td>
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<tr>
<td></td>
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<td>- Travail avec déplacement dans des conditions difficiles</td>
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<td></td>
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<td>- Travail avec exposition aux intempéries ou à la canicule</td>
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<tr>
<td>Nature des opérations</td>
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<td>- Opération avec points chauds</td>
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<td>- Opération avec projections</td>
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<td></td>
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<td>- Opération avec gaz, vapeur, poussières</td>
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<td>- Opération avec manutention manuelle</td>
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<td>- Opération avec manutention mécanique</td>
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<td></td>
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<td>- Opération avec utilisation de produits dangereux</td>
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<tr>
<td>Moyens</td>
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<td>- Moyen défectueux ou inadapté</td>
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<tr>
<td>Intervenants</td>
<td></td>
<td>- Absence ou défaut de formation</td>
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<td>- Manque d'expérience</td>
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<td>- Coactivité</td>
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<td>- Stress, fatigue</td>
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</tbody>
</table>
Elimination or reduction of risk

General principles of prevention

- Inherently safe design measures
- Protective measures
- Instructions

Measures implemented by the user

- Organisation
- Supplementary protective means
- Personal Protective Equipment
- Training

Intrinsically safe improvement measures
Software features

- Database management attached to risk assessment folders
- Hazards identification by a list of questions sorted in 2 major categories:
  - hazards related to the equipment and its environment
  - hazards related to the maintenance operation
- Possibility to add questions not provided in the hazards list
- Risks characterization
- Identification of preventive and protective measures from pre-established lists
- Possibility to identify additional measures
Software features (cont’d)

- Overall dashboard
- Possible outputs: printout or html file
- Online help
- Ressources files included in the software to get useful information and documentation about risks
- Import and export functions available for risk assessment files
- Possibility to insert computerized files into folders (photos, technical documents, vidéos, …)
Software usages

- Preparation of safe maintenance plans
- Help for making prevention plans with contractors
- Definition of safe maintenance procedures
- Traceability and follow up of maintenance operations
- Update of occupational risk assessment document
- Training and information of maintenance people
- Capitalization of maintenance operations (lessons learned)
Exemple de telecharger software de PARI Maintenance :

www.cram-alsace-moselle.fr/Prevent/doc/docmaintenance.htm