

RISCO ZERO Program – Technological Innovation for Safety Culture Development

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Abstract

The identification and treatment of unsafe conditions is one of *Mineração Paragominas*' premises, seeking for a zero-incident work environment, reinforcing leadership commitment and empowerment for each employee, in a way that they can have an effective process to exercise these registries and follow-up their resolution. The "Risco Zero" tool is designed to guarantee that anyone can report an unsafe condition, risky behaviour, near-miss event or right of refusal through an online form that can be accessed by smartphone, via QR Code, or through paper blocks – pocket forms. Records can be classified at different levels, according to the risk's degree, and their follow-up is part of the leadership routine, established in the BABS (Bauxite & Alumina Business System) governance through weekly HSE inspections, that are guided to verify the attendance of "Risco Zero" reported items. With ease of registration, disclosure among areas and transparency in risk treatment, the tool had a 14-fold increase in the number of registrations - over 6,000 items - in comparison with 2017. This innovation led to a safer work environment, leading to a significative TRI reduction in 2018.

Keywords: HSE, Risco Zero, risks.

1. Introduction

Mineração Paragominas has been consistently working on incident prevention, increasingly seeking people development and robustness in systems and processes, building a sustainable HSE culture. Through the critical global analysis of occurred HSE events in 2016 – which was the best year in terms of combined TRI frequency rate (0.72) – it was identified that the number of recorded near-misses was very low and the HSE team was challenged to propose something that would support a larger report of these events. As Reason [1] highlighted:

"An inability to recognize and respect the full extent of the operational hazards can lead to the creation of more and longer-lasting holes in the defensive layers."

During the discussion on the development of a proactive tool for identifying and effectively registering risks in HSE, some premises were adopted, which included the interface with the integrated management systems proposed by BABS and industry 4.0, embracing its use for all employees and visitors. In August 2017, a manual pocket form was initially developed, which would later be filled at an online form within SharePoint, supported by HSE facilitators from each area.

However, with the need for more accurate and agile records and response, a QR Code (Figure 1) was developed for direct access to the form, as well as the massive dissemination of the tool to all operational teams.



Figure 1. QR Code disclosure.

The design of the tool was developed in a way that makes the registry simple and intuitive, yet with traceability and minimum detailing of the inputs to be reported, which makes it possible to accurately identify the location of the registry and the risk condition.

With the tool update, the form migrated to Microsoft Forms, which allows the optimization of the records, including the immediate notification to the responsible area after the sending of any "Risco Zero". By providing agility in the communication channels and, consequently, risk treatment [2], improving these channels can improve the status of hazard reporting.

2. Method

The "Risco Zero" issuer – when identifying an unsafe condition, risk behaviour, near-miss event or right of refusal – will access the online form (Figure 02) and fill in the fields, informing the location, nature of the event, issuer ID with its contacts, responsible area for the action, characteristic and classification of the risk, as well as describe the occurrence and the expected actions (optional). After completing the form, the record goes to the SharePoint database and is in the headlight of the responsible area.

Formulário do Risco Zero

Numero do formulário: Data do registro:

Dados do local onde o risco foi encontrado:
 Site: Miltônia Tomé-Açú Barcarena Sítio-Tatu Paragominas
 Área: Setor: Onde:

Dados do departamento que está realizando a inspeção:
 Emissor do risco zero: Responsável pelo registro:
 Contato (Celular): Contato (E-mail):
 GG resp. insp.: GA resp. insp.: Sup resp. Insp:
 Empresa:

Dados da característica do risco
 Desvio: Comportamento de risco Condição de risco Direito de recusa
 Quase acidente (SSO) Quase acidente (MA)
 Classificação do risco: Baixo Médio Alto
 Risco de HSE: Saúde/Segurança Meio Ambiente
 Riscos Críticos: Outros:
 Descrição da ocorrência:
 Deve ser feito:
 O que foi feito:

Dados do responsável pela ação
 GG resp. acao: GA resp. acao: Sup_Resp_Acao:
 Data prevista Encerramento: Data do encerramento:
 % Complete:
 Foi dado feedBack ao emissor

Registrar ➔

Figure 2. Risco Zero online form.

Once in this database (Figure 03), the appropriate personnel can check all the registries and provide feedback and updated status for each case and may also propose new deadlines to mapped actions that require a longer time to complete. Until the case is closed, it will appear as “ongoing” in the system, but if the deadline is expired, it will be shown as “backward” status. The area can filter each type of registry condition, for better control.

ID	Task Name	Start Date	Due Date	Data do encerramento	% Complete	Classificação do risco	Desvio	Risco de HSE	Riscos Críticos	Sup_Resp
6060	Mina 3	8/29/2018	8/29/2018	8/29/2018	100.00 %	Baixo	Condição de risco	Saúde/Segurança	Prevenção de Quedas	SUPERVIS CARREGA & SUPOR
5267	P2	8/24/2018	8/24/2018	8/24/2018	100.00 %	Alto	Condição de risco	Saúde/Segurança	Avaliação de Risco	SUPERVIS LAVRA
5260	acesso 6 e/f e 6 f/g	8/23/2018	8/23/2018	8/23/2018	100.00 %	Médio	Condição de risco	Saúde/Segurança	Sinalização/Isolamento	SUPERVIS CARREG & SUPORTE

Figure 3. SharePoint area follow-up database.

Weekly, the site leadership follows-up on the reported actions, being able to focus within the resolution of risks with the local team or to verify if the implemented reported actions are in place.

3. Results and Discussion

To be effective, an HSE tool must have a scope that justifies its purpose and reinforces its importance through results that can be useful and beneficial to users, generating credibility between our employees.

Through the realization that all employees should be able to register the conditions, it was also necessary to focus on a way so that the problems pointed out were effectively discussed and treated by the leaders, so that the engagement could be perceived, and the tool did not fall into disuse.

The local leadership, through stimulation and empowerment, reinforces the feeling of "area ownership" among the operational teams, imbuing the practice of reporting and dealing with deviations, insofar as they are identified. To make the tool and its inputs more visible, a dashboard in PowerBI (Figure 04) was shared, showing in real time the quantity of reported registries and treated items, that can be filtered by area, status, type or by sender.

Risco Zero
DASHBOARD RISCO ZERO - HYDRO PARAGOMINAS

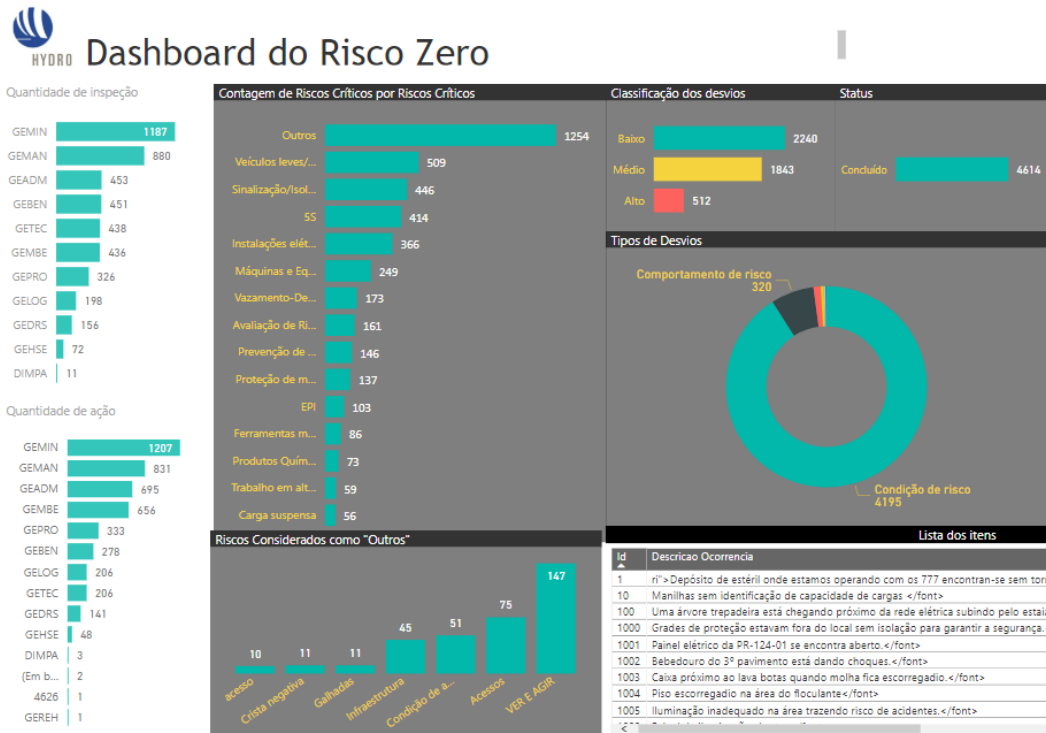


Figure 4. Risco Zero dashboard – PowerBI.

In addition to the reinforcement and genuine care of the management team in sight and follow-up of the actions, the employees are recognized by the leaderships during the DMS (Daily Management System) and improvements registries encouraged by BABS team. This engagement is visible in the quantity and quality of the records: in 2017, although the tool was implemented in August, there were 429 registries - all treated. In 2018, until July, there are more than 6,000. A reduction in the number of TRI events has also been achieved (Figure 05) – 01, compared to the same period last year – 05.

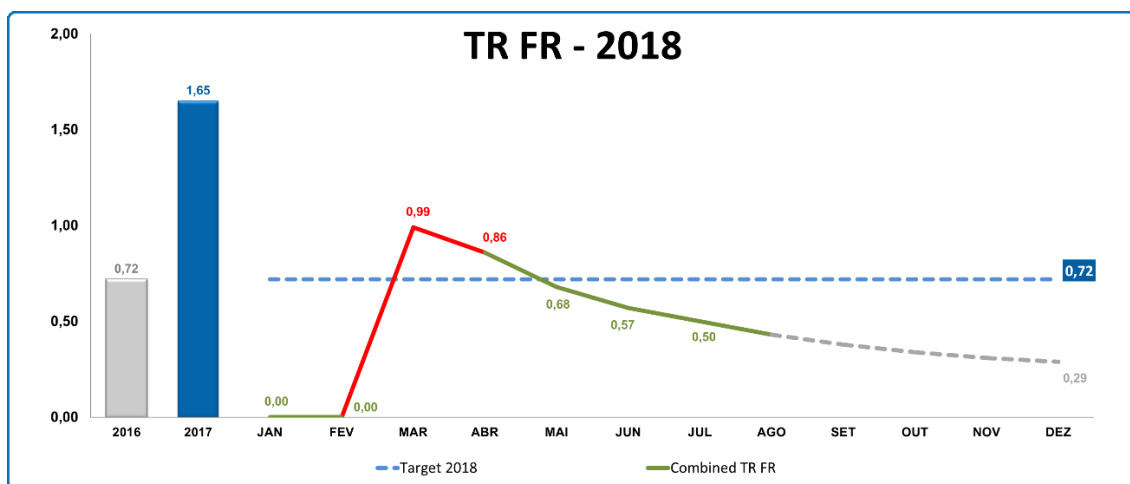


Figure 5. Mineração Paragominas frequency rate.

4. Conclusion

The tool described here is a foundation that contributes positively to the HSE culture development at Mineração Paragominas, promoting awareness for stages that separate reactive or controlling mindset scenarios from proactive and generative levels.

It has been observed that “Risco Zero” main benefits were:

- Employees engagement and HSE awareness;
- Reduction of incidents;
- Visible leadership;
- Accountability – We are solving the problems with transparency and feedback.

5. References

1. James Reason, *A Life in Error – From little slips to big disasters*, Ashgate Publishing Limited (2013), 81-83.
2. Mahdi Bastan et al., Impacts of Safety Performance and Culture on Work-Related accidents: A system dynamics model. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, Rabat, Morocco, April 11-13, 2017, 09-10.