IN PRACTICE

How to build a risk assessment matrix (IPER) with the NTP 330 method

Deficiency times exposure gives probability, and probability times consequences gives the level. The math is simple. Naming the hazard well is the hard part.

Published October 28, 2026 · next review: if INSST replaces or withdraws NTP 330, or if art. 5 BIS of Decree 127/014 (prevention plan for 5 to 50 workers) changes

NTP 330 is a technical note from Spain's National Institute for Occupational Safety and Health (INSST), published in 1993: "Sistema simplificado de evaluación de riesgos de accidente" (a simplified system for assessing accident risks). NTPs are good-practice guides, not regulations. The values in this guide are the ones in its tables. In Spanish, the matrix is called an IPER (identificación de peligros y evaluación de riesgos), and the abbreviations below are the method's own, so they match what you'll see in a matrix prepared locally.

In Uruguay, the prevention plan for companies with 5 to 50 workers has to include hazard identification, risk assessment, corrective measures and a schedule (Decree 127/014, art. 5 BIS, added by 52/023; the official text is in Spanish). The decree doesn't name a method. The labor inspectorate (IGTSS) asks for the assessment to be done "por métodos reconocidos y específicos" (by recognized, specific methods).

First, the hazard

Hazard: a source capable of generating risk.

In the matrix, the hazard is written as the thing itself: the blade, the reel on the shaft, the film on the floor. "Cut," "impact" or "fall" aren't hazards: they're what can happen, and they go in the risk column. A row that starts from the accident ends up with a control aimed at the person instead of at the blade.

The method in four numbers

Deficiency level (ND): how much the existing controls fall short.

- **10, very deficient (muy deficiente):** significant risk factors; existing controls aren't effective.
- **6, deficient (deficiente):** at least one significant factor that needs correcting; the controls are noticeably less effective.
- **2, improvable (mejorable):** minor factors; the controls aren't noticeably less effective.
- **Acceptable (aceptable):** nothing notable found. Not scored.

Exposure level (NE): how often someone is exposed.

- **4, continuous (continuada):** several times a shift, for extended periods.
- **3, frequent (frecuente):** several times a shift, even if briefly.
- **2, occasional (ocasional):** at some point in the shift, for a short time.
- **1, sporadic (esporádica):** irregularly.

Probability level: NP = ND × NE.

- **Very high (MA), 24 to 40:** the risk materializes often.
- **High (A), 10 to 20:** it may happen several times over a working life.
- **Medium (M), 6 to 8:** it may happen at some point.
- **Low (B), 2 to 4:** not expected, though conceivable.

Consequence level (NC), for harm to people (the NTP also has a property-damage column, which carries less weight):

- **100, fatal or catastrophic:** one or more deaths.
- **60, very serious:** serious injuries that may be irreversible.
- **25, serious:** injuries causing temporary inability to work.
- **10, minor:** small injuries that don't require hospitalization.

The consequence scale runs much longer than the probability scale on purpose: according to the NTP, consequences should always weigh more.

Risk level: NR = NP × NC, grouped into four intervention levels:

Level	NR	What it means
I	600 to 4000	Critical situation. Urgent correction.
II	150 to 500	Correct and put controls in place.
III	40 to 120	Improve if possible. The intervention and its cost-benefit should be justified.
IV	20	Don't intervene, unless a more precise analysis justifies it.

An example

Made up: changing the reel on a film slitter, in a packaging plant that doesn't exist. It happens three times a shift, briefly each time (NE 3).

Hazard	Risk	ND	NE	NP	NC	NR	Level
Rotary blade	Cut or amputation of fingers	6	3	18 (A)	60	1080	I
40 kg reel on the shaft	Foot injury if it drops during mounting	2	3	6 (M)	25	150	II
Film scraps on the floor	Slip or trip on the same level	2	3	6 (M)	10	60	III

- **Blade, ND 6:** the guard is there, but its interlock is bypassed.
- **Reel, ND 2:** there's a cart to bring it over, but the last stretch is done by hand.
- **Film, ND 2:** it's cleaned up at the end of the shift, not during it.

Writing down why each ND was chosen, next to the row, is what lets someone else arrive at the same number.

Controls, in order

The hierarchy of controls: eliminate, substitute, engineering controls, administrative controls and, last, personal protective equipment (ISO 45001, 8.1.2). In Uruguay, Decree 291/007 requires prevention to be planned acting first on the source of the risk, then on how it spreads, and last on the worker (art. 5 lit. a). Decree 246/024 calls for prioritizing elimination and leaves personal protection as the last resort, at no cost to the worker (art. 3 lit. c).

For the blade, that means an interlock that can't be bypassed and locking out the blade during the reel change, ahead of a written procedure or cut-resistant gloves. With the interlock working, ND drops to 2: NP 6, NR 360, level II. The control lowered the probability. The consequence of a blade is still the consequence of a blade.

With a fatal consequence the math is tougher: improvable deficiency and frequent exposure give $2 \times 3 \times 100 = 600$, level I. As long as the hazard is there, the method won't let the row rest. What gets it out of level I is removing the hazard or separating it from the person.

When to review it

The prevention plan has to be redone at least every six months and whenever working conditions change: new technology, a modified process, or any other factor that makes it necessary (art. 5 BIS). Decree 291/007 also requires assessing new risks from technological innovation (art. 5 lit. c).

In practice, rows get reopened after an accident or incident, a finding, a new task or machine, or a new contractor on site. The NTP itself ends with a step that often gets skipped: checking the results against what happened afterward, and whether the controls worked.

The other reading

- **The NTP says its levels are indicative.** To set priorities, it adds cost, how many people a control reaches, and what workers think.
- **It's a method for accident risks.** Noise, chemicals or ergonomics call for measurement: Decree 406/988 requires systematic monitoring of the work environment wherever there's exposure to agents (T.IV art. 2).
- **ND is a judgment call.** Two technicians can score the same machine differently. That's why the reason should be written down.

A matrix that hasn't changed since the last new machine describes a different plant.

This is handled by **VivoGRC HSE**

In VivoGRC HSE, the level is calculated with NTP 330 from each risk's deficiency, exposure and consequence, and Riesgoberto flags any risk whose only controls are administrative or PPE. A person approves every change.

SOURCES

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