Beyond Purdue: The Works

Overview V1.0 | 3 November 2026 | Petr Roupec, BM Global

Purdue sorts devices by where they sit. Beyond Purdue sorts them by what they are allowed to do.

The works describe one model at several depths. Every document and every explainer follows the same order: the laws first, then data in independent nodes, then names and aliases, then everything that results from them. People work inside the plant, so their safety is part of every step.

The order of every explanation

1. **The Laws of Authority.** The main principle. Who is allowed to do what. The simpler and more predictable a level, the more authority it holds. Protection and isolation are absolute, and a lock outranks every level. AI has a voice, not a vote.
2. **Data lives in independent nodes.** The second idea. Each signal, asset or record is a small node with its own name, data and meaning. Everything that follows is a result of this. The technology is what people already know: DNS, IPv6, multicast, OPC UA.
3. **Names and aliases.** Naming and asset management is always the big issue. DNS-style names, because people already read them, updated automatically, by a person or by a shout. Aliases (KKS code, vendor tag, HMI name, asset number) find the same node.
4. **At least two copies.** Every node lives in at least two copies, on different hardware, power and rooms, to be really redundant. They listen to the same shouts and never sync.
5. **Shouts.** Every message goes one way, is repeated, and is never acknowledged.
6. **The data diode, the enabler.** Light travels one way, so data and commands cannot mix. Passive by preference, and each diode is named like any other asset.
7. **Every command leaves two marks:** given and executed.
8. **People inside the plant.** When equipment is released for work, the lock holds it still.
9. **Enforced by construction:** copper, light, direction and locks, not software alone.

Read in this order

Step	Document	Answers	Version
1	The Laws of Authority, One Pager	Who is allowed to do what: six levels and their laws on one page.	V1.0
2	The Laws of Authority, Statement	The laws in full, each with its basis in standards, then nodes, names and copies.	V1.0
3	Article and LinkedIn Article	The one pager explained in prose, in the same order.	V1.0
4	Levels of Authority Drawings	How the levels stand around the data plane. K: the four plant states. M: the data diodes as named assets.	V1.0
5	Data Plane Concept	The laws, the node, names and aliases, two copies, shouts, the diode, the command record, maintenance.	V1.0
6	The Works (video) and Narration	The same order in motion, narrated.	V1.0
7	Data Plane Implementation and Deployment Plan	How it is built, tested and deployed, read only first, with the diode inventory.	V1.0
8	Data Diodes as the Enabler, Suggestions	The working paper behind the diode changes.	V0.1
9	Maintenance is Operation, Suggestions	The working paper behind the safety changes. Unchanged.	V0.1
10	Universal Control System, One Pager	The model applied: one HMI, open controllers, step by step while the plant runs.	V4
11	Eight Questions by Level of Authority	Eight practical questions, each answered at its level.	V1.0

Shared texts

These are used word for word in every document.

- **L0 Protection and isolation.** Absolute. Allowed: trip, veto over every level, hold the lock. Never allowed: be overridden, or depend on any other level.
- **Law Zero.** No harm to people or the environment, by action or inaction. Nothing is allowed to weaken protection. A lock outranks every level.

- **Fifth Law.** Data nodes process, store and present data on demand. They record every command, permit, lock and bypass. They grant no access and take no action.
- **The diode.** The data diode is the enabler. Light travels one way, so data and commands cannot mix. The levels hold because the diode holds.
- **Copies.** At least two copies of every node. They listen, they never sync.
- **Four plant states.** In service, released for work, under test, returning to service.

Changes in V1.0

Every document now follows the order above. New: names and aliases with three ways to update a name; at least two copies as a principle; the data diode as the enabler and as a named asset (Drawing M, the diode suggestions paper). No law changed. Older versions of every document are kept.

Sources:

NIST glossary, data diode: https://csrc.nist.gov/glossary/term/data_diode
NIST SP 800-82r3: https://csrc.nist.gov/pubs/sp/800/82/r3/final
IEC 62443-3-3: https://webstore.iec.ch/en/publication/7033
RFC 1034, DNS and CNAME aliases: https://www.rfc-editor.org/rfc/rfc1034
ISO 14118:2017: https://www.iso.org/standard/66460.html
ISO 13850:2015: https://www.iso.org/standard/59970.html