

Release Notes

Fire Risk Investigation 3D

Version 1.3.0

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System requirement change: FRI3D 1.3.0 requires **Windows 10 version 1903 or later** (or Windows 11). Older Windows 10 builds start FRI3D, but non-English names are corrupted again. See *Changes that affect existing models*.

Highlights

- **Japanese and other non-English names are able to be imported/exported.** Zone, scenario, item and basic-event names in Japanese, German, Ukrainian and other languages now reach the project file, the CFAST and FDS input files, the reports and the RiskSpectrum/FranX exports intact. Japanese scenario and project names no longer stop a CFAST run.
- **Pause, resume and wall-time limits for FDS runs.** Pause a long FDS run, close FRI3D, and resume it later from where it stopped. An optional wall-time limit pauses the run instead of discarding it.
- **Full-room burnout scenarios in one click.** Create a scenario in which every component, raceway and cable in the compartment has failed, without running a fire simulation.
- **Edit the PRA logic mapping in FRI3D.** Link and unlink raceways, cables, components and basic events from the Logic Inspector's right-click menu, instead of

editing the spreadsheet and re-importing.

- **More accurate FLASH-CAT cable tray fires**, checked again against NUREG-1934 Appendix B. The NUREG-1934 validation models and reference input files ship with this release.
- **Better CAD import.** STEP and IGES assemblies import every part once, in the right place and in metres. glTF/GLB, OBJ and STL as well.

What's new

Language support (Japanese and other languages)

- **Names in any language are stored correctly.** Before this release, text typed in FRI3D crossed into the engine in the wrong encoding. On screen it looked correct, but the project file, the solver input files, the reports and the exports received corrupted text, and names created by the engine (for example from an import) showed  in place of Japanese characters.
- **Older projects are repaired when they are opened.** Text that earlier versions stored in the wrong encoding is detected and corrected the first time 1.3.0 opens the project. Correct text, including all Japanese text, is left alone.
- **CFAST runs with Japanese scenario and project names.** The bundled CFAST failed with "error 4 from routine exehandle" when the run folder contained Japanese characters. It now runs normally.
- **The solver input files explain their identifiers.** CFAST and FDS accept only plain ASCII identifiers, so FRI3D writes a name such as  for an item whose name is not ASCII or is too long. Each CFAST and FDS input file now starts with a legend that maps these identifiers to the names in your model.

- **Numbers are always entered with a decimal point.** On a computer set to a language that uses a decimal comma, typing `1,5` in some fields (fire curve tables, fire material chemistry) silently became 0. These fields now accept `1.5` and refuse `1,5`, and a value that cannot be read keeps its previous value.
- **RiskSpectrum identifiers match regardless of letter case.** RiskSpectrum stores basic-event and initiating-event IDs in upper case, so mixed-case IDs in FRI3D were silently dropped. IDs containing dots or brackets now also match exactly.

FDS runs: pause, resume and time limits

- **Pause and Resume.** The FDS progress window has **PAUSE**. FDS writes a restart file and stops; you can then **RESUME** at once, or **CLOSE** the window and resume later — even after closing FRI3D — from **Resume FDS Run** on the scenario's right-click menu in the Scenario Inspector. Running a paused scenario again asks whether to **Resume**, **Start Over** or **Cancel**.
- **Resume uses the model as it was when the run was paused.** If you have changed the model since, choose Start Over to simulate the changes.
- **Cancel is now Terminate.** Terminate stops a run for good; terminating a paused run deletes its restart files.
- **Wall Time Limit and Stall Timeout** fields in the Simulate Scenario dialog. There is no wall-time limit by default (earlier versions stopped every FDS run after 12 hours). When a limit is reached, the run is paused, not lost, and can be resumed.
- Equipment failures are calculated once, when the run finishes.

Full-room burnout scenarios

- **Full-Room Scenario** on the Scenario Inspector's right-click menu creates `<scenario>_FullRoom`, in which every component, raceway and cable in the scenario's compartment(s) has failed at $t = 0$. Use it for full-room burnout PRA cases that need no fire simulation.

- A new read-only **Failure Method** property shows why an item failed: **Manual** for a full-room burnout, otherwise the fire simulation method.

PRA logic editing

- **Link and unlink from the Logic Inspector.** Right-click a zone, raceway, cable, component or basic event to link an existing item under it, or to unlink it from the row it sits under. A zone takes raceways, cables and components; a raceway takes cables, components and basic events; a cable takes components and basic events; a component takes basic events.
- **A fast picker for large plants.** "Link ..." lists every item of that type and narrows as you type — names starting with your text first, ignoring letter case and surrounding spaces. Arrow keys move the highlight, Enter links, and Tab completes the name as far as the matches agree. The list loads once per project, so even 100,000 basic events stay responsive.
- **Several rows at once.** Select several rows and link one item to all of them in a single step; rows that already have it are left alone.
- **Link a basic event to many items.** On a basic event, **Link to Components / Cables / Raceways...** lists every component, cable and raceway in the project, with a search field. Tick or untick items and click **Apply** to change all of the links in one step.
- **Create a basic event where you need it.** The basic-event picker can create a new basic event (Standard or Spurious, with its spurious probability) and link it to the selected rows. Names that already exist are refused, and the name must match your PRA model to affect results.
- **Start the basic-event mapping again.** "Clear Basic Event Links (All Zones)" on the zone row removes every link to a basic event in the project, and "Unlink from All (All Zones)" on a basic event removes all of its links. The basic events themselves are kept.

- **A warning before an item leaves every zone.** If an unlink would take a raceway, cable or component out of every zone — where no zone fire can fail it — FRI3D says so, counts what goes with it, and offers to keep it under the current zone instead.

CAD and BIM import

- **STEP and IGES assemblies import correctly.** Every placed part is imported once, at its position in the assembly, converted to metres from the file's own unit. Before, nested sub-assemblies were imported twice, unnamed parts and loose faces were dropped, and some files stopped with an error.
- **glTF/GLB, OBJ and STL are read through the same engine as STEP**, so nested parts, repeated parts, names and positions come through. Current glTF/GLB files, which imported as nothing before, now import.
- **Import options for CAD files.** The Import BIM/CAD dialog now shows the options of the file type you select: for OBJ and STL, the file's unit and up axis (STL is read Z-up by default, OBJ Y-up); for STEP and IGES, the mesh tolerance.
- The file filters list only the formats FRI3D reads: BIM/IFC, 3D CAD (STEP/IGES) and 3D mesh (glTF/GLB/OBJ/STL). FBX, DAE, USD, PLY and DXF are refused with a message saying which format to convert to.

Improvements and fixes

Simulation accuracy (FLASH-CAT cable tray fires)

- **CFAST:** the burning trays above a fire are now written as one stacked fire. The lowest tray ignites when the fire's flames reach it, as in NUREG-1934, instead of

after a fixed five minutes from the start of the fire. Upper trays follow with the FLASH-CAT delays (4, 3, 2, 1 minutes, then 1 minute each).

- **FDS:** the lowest tray ignites when the flames reach it or when its cables reach their failure temperature. The tray fires now burn (before, they switched on but released no heat), and the ignition delays are correct for every tray group.
- **FDS runs with thin cable trays start.** A tray thinner than the FDS grid cell could collapse onto the grid, and FDS stopped with "VENT ... must be attached to a solid obstruction". Tray fires are now kept on a solid tray, as source fires already were, and the change is reported in the run's model checks.
- **FDS cable failure times come from FDS's own THIEF cable model**, at the cable inside the tray. Before, FRI3D recalculated them from a gas probe below the tray, which could make the first cable to heat up fail last.
- **THIEF cable failure:** corrected the cable material for cables with no specification, the conduit model (now used only for conduits), the failure temperatures for thermoplastic and thermoset cables, and the time axis of FDS results (FDS cable failures were about ten times late). Empty trays no longer write an invalid fuel, and the FDS THIEF sensor is placed inside the tray.
- **FLASH-CAT ignition defaults** were stored in the wrong units (°F and W/m²). They are now 205 °C / 330 °C and 6 / 11 kW/m².
- **NUREG-1934 Appendix B re-validated.** CFAST tray ignitions at 482 / 722 / 902 s against NRC's 480 / 720 / 900 s, and a peak hot-gas temperature within 0.2 °C of NRC. A new FDS validation against NRC's own FDS deck lights the lowest tray at 472 s (NUREG-1934: 480 s), fails the lowest tray's cable within 7 s of NRC's, and matches the heat release at 1200 s within 1 %. See the [CFAST](#) and [FDS](#) Appendix B validation pages.
- **The NUREG-1934 validation models ship with FRI3D**, in [ValidationModels](#), with the exact CFAST and FDS input files behind the published results — including a new Appendix A model with purge ventilation.

PRA and plant data import

- **Clearing PRA links on import no longer empties zones or scenarios.** The plant-data importers' "clear PRA links" option also removed components' zone membership and scenario contents whenever a project held those links. It now removes only the basic-event links and the cable/raceway-to-component mappings that the spreadsheet puts back.
- **A simpler Import Plant Data dialog.** Three options, the same for spreadsheets, Access files and FRANX files: **Merge Items** (adds new items and updates existing ones), **Merge Links** (adds the file's links and keeps existing ones) and **Replace Links** (removes the existing links of each kind in the file, then adds the file's; FRI3D asks before going ahead). Merge Items and Merge Links are on by default. With an option off, that part of the project is left alone. The MERGE checkbox is gone: the import is always saved into the project.
- **Failed imports are reported.** If a plant-data import fails, FRI3D now says so, shows the importer's reason, and leaves the open project as it was. Before, a failed import looked like a successful one.
- **Rows FRI3D cannot use no longer stop the import.** A link row naming an item that does not exist, or a pair FRI3D has no link for, is skipped and the rest is imported; FRI3D lists the skipped rows in a warning afterwards. Zone-to-basic-event rows are skipped the same way: link the basic event to a raceway, cable or component instead.
- **Raceways and components can link to spurious basic events on import.** Only cables could before, and a raceway or component row aborted the whole import.
- **Updating existing items works for spreadsheets.** It was ignored for .xls/.xlsx files, and on its own it made the import fail.
- **Replacing links also replaces basic-event and scenario links.** Links read from the basic-event and scenario sheets were added next to the old ones instead of replacing them. Scenario contents added in FRI3D (components and basic events) are kept.

- **RiskSpectrum clean-up no longer deletes another scenario's rows.** Cleaning up a scenario named "Test" also deleted the rows of "Test2".

Stability

- Fixed a crash when switching scenarios after a plant-data import.
- A zone and a scenario with the same name are now reported when the project opens, instead of causing an empty zone tree or a crash later. Zone and scenario switch errors name what failed and no longer suggest "please try again".
- Fixed a memory leak that grew on every zone switch, tree load and report.
- Imported geometry of items whose names contain characters not allowed in file names is now saved and found again.
- The project recovery prompt opens over the main window.

Changes that affect existing models

- **Windows 10 version 1903 or later is required.** On older Windows 10 builds, non-English names don't work as before 1.3.0.
- **Projects with non-English text are repaired on first open.** Text that earlier versions stored in the wrong encoding (mainly hand-typed accented Latin characters such as ü) is corrected. Save the project to keep the repair. Back up projects you will still need to open with 1.2.0.
- **FLASH-CAT results change.** Tray ignition times, tray fire heat release and THIEF cable failure times change in both CFAST and FDS. **Re-run scenarios with cable tray fires** rather than comparing against 1.2.0 results.
- **FDS runs have no wall-time limit by default.** Set one in the Simulate Scenario dialog if you need it.

- **The importers' command line is stricter.** `Import_PLANTX_XLS` and `Import_PLANTX_ACCDB` now reject an unknown option (a typo such as `--UpdateLink` used to be ignored), a misspelled value such as `--AddItems flase` (it used to mean true), and a stray third argument (it used to overwrite the project). An option may now come before the file paths. Scripts that relied on the old behaviour stop with an error message instead of doing something unintended.
- **CAD files import differently.** STEP/IGES models are now in metres and may contain parts that were missing before; STL is read Z-up. Re-import CAD geometry to benefit; existing imported geometry is unchanged.
- Link edits are saved with the project (File → Save), like other edits.
- Changing which raceways, cables or components are linked changes what a fire can fail. Fire failure results already computed keep the previous links until the fire simulation is run again; FRI3D reminds you after such a change. Basic-event links take effect at the next PRA calculation.

Known issues

- A separately installed CFAST (not the one bundled with FRI3D) still fails on Japanese scenario or project names. Use the bundled CFAST.
- Link edits in the Logic Inspector cannot be undone with Undo.
- Importing a fire source with the same name as a vent turns the vent into a fire source. Keep source and vent names distinct.