M75B Hard liner

Perfect—let’s lock this in with two copy‑paste ready docs for docs/. I’ve written them to (1) explain the technical + accounting choices (with IFRS references) and (2) serve as the runbook / “poor man’s CI” for repeatable runs and smoke verification.

**Note:** I’m **not** delivering any .zip.  
These are full .md contents you can paste into your repo.

**1) docs/m7\_5b\_tech\_and\_ifrs.md**

# Module M7.5B – Technical & Accounting Note (with IFRS alignment)

\*\*Scope.\*\* M7.5B rebuilds the three primary artifacts (CF, BS, P&L) from upstream modules, applying a hard subordination gate to junior funding so that closing cash never drops below the configured buffer. It does \*\*not\*\* re‑calculate M5 cash flows; it \*\*uses\*\* M5 roles as the single source of truth.

- \*\*Inputs (from `outputs/`):\*\*

- `m5\_cash\_flow\_statement\_final.parquet` with roles: `Month\_Index`, `CFO\_NAD\_000`, `CFI\_NAD\_000`, `CFF\_NAD\_000`.

- `m0\_opening\_bs.parquet` (reads `Line\_Item='Cash'` for opening cash; requires a `Month\_Index` column).

- Optional freeze: `m7\_selected\_offer.json` (see “Freeze choice” below).

- \*\*Outputs (to `outputs/`):\*\*

- `m7\_5b\_cash\_flow.parquet`, `m7\_5b\_balance\_sheet.parquet`, `m7\_5b\_profit\_and\_loss.parquet`

- `m7\_5b\_debug.json` (diagnostics), `m7\_5b\_smoke\_report.md` (human‑readable checks)

Implementation lives in `src/terra\_nova/modules/m7\_5b\_rebuild/runner.py`. :contentReference[oaicite:0]{index=0}

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## 1) Freeze choice and classification

M7.5B attempts to read `outputs\m7\_selected\_offer.json`. If present, it extracts:

```json

{

"selected\_option": "A\_SAFE",

"instrument": "SAFE",

"classification": "equity\_like" // or "debt\_like"

}

* If the file is **missing** or malformed, M7.5B falls back to a **shim**: option='A\_SAFE', instrument='SAFE', classification='equity\_like'. This ensures deterministic behavior in CI and prevents runs from failing when the freeze selector hasn’t been emitted yet. (The shim is logged once per run and does **not** alter core M5 flows.)

**Effect on cash flow presentation.** Junior injections are modeled explicitly in M7.5B (see §3). The classification doesn’t change the **M5 roles** (CFO/CFI/CFF) but controls how the *incremental* junior gate is labeled and traced in debug.

**2) Cash‑flow assembly and invariants**

**Source of truth.** M7.5B **always** uses M5’s CFO\_NAD\_000, CFI\_NAD\_000, CFF\_NAD\_000 as emitted (no recomputation here).  
**Opening cash.** Taken from m0\_opening\_bs.parquet (Line\_Item='Cash', NAD ’000). If not found, the runner fails in strict=True.

**Rolled statement (high‑level):**

Let t be a month in Month\_Index, and Cash\_t the closing cash:

Cash\_t = Cash\_{t-1} + CFO\_t + CFI\_t + CFF\_t + JR\_t

where JR\_t is the *junior injection* applied by the hard subordination gate so that:

Cash\_t ≥ min\_cash\_buffer\_nad\_000 (configured at run time)

JR\_t ≥ 0 (no forced withdrawals)

**Emissions into artifacts:**

* **CF**: adds Closing\_Cash\_NAD\_000 (rolled series) and the JR\_t trace in debug.
* **BS**: sets Cash\_and\_Cash\_Equivalents\_NAD\_000 := Closing\_Cash\_NAD\_000.
* **P&L**: a minimal pass‑through (we don’t restate revenue/OPEX/DA; only link interest if required by smoke).

**Invariants enforced (and asserted in smoke):**

1. **BS ties:** Total\_Assets == Total\_Liabilities\_And\_Equity within a tiny tolerance.
2. **Cash link:** CF.Closing\_Cash equals BS.Cash\_and\_Cash\_Equivalents.
3. **Role integrity:** CFO/CFI/CFF columns exist and are numeric; month index is contiguous.
4. **No negative closing cash** when min\_cash\_buffer\_nad\_000 ≥ 0.  
   All invariant checks and max deltas are written to m7\_5b\_smoke\_report.md.

**3) The subordination gate (junior)**

**Objective.** Prevent insolvency states in the monthly roll. For any t, if Cash\_{t-1} + CFO\_t + CFI\_t + CFF\_t < buffer, inject JR\_t to raise it to the buffer floor. Sum of JR\_t is reported in the console (“Junior injection total”), and the time series lands in debug for audit.

This *does not* re‑label M5 flows; it adds **explicit** junior cash at the gate so that the final CF and BS remain internally consistent.

**4) Accounting policy choices (cash flow categories)**

**Operating (CFO).** We use the indirect method: start from profit (NPAT), add back non‑cash (e.g., depreciation), and include net working capital cash effects—i.e., CFO\_NAD\_000 provided by M5. This is consistent with IAS 7’s indirect method practice, and with mainstream guidance on cash flow presentation (KPMG’s handbook coverage on interest and indirect method).

**Investing (CFI).** Capital expenditure outflows are presented in **investing** cash flows (negative). This aligns with standard practice for PP&E additions.

**Financing (CFF).** Revolver **draws/repayments** and eligible fees are financing flows—interest is **not** embedded in CFF because we capture interest through the P&L and CFO (indirect method). This aligns with authoritative guidance discussing debt proceeds/repayments as financing, and separate handling of interest cash flows.

**IFRS presentation context.** IFRS 18 reinforces aggregation/disaggregation principles for primary statements (including the statement of cash flows) and—importantly—moves practice toward more consistent classification of interest and dividends. Our policy (interest treated within operating under the indirect method; draws/repayments in financing; capex in investing) is consistent with current practice and compatible with IFRS 18’s emphasis on structured summaries and clearer labelling.

**5) Currency and FX labelling**

All **base calculations** occur in **NAD ’000**. Where management reporting in USD is needed, we present *labelled* USD views created by translating NAD using period FX metadata captured in debug. IFRS 18’s presentation principles emphasize clear labelling and disaggregation—our USD columns are supplemental for comparability; primary books remain in NAD.

**6) Data contract (key roles)**

* Month\_Index – integer, contiguous months starting from M0’s base.
* CFO\_NAD\_000, CFI\_NAD\_000, CFF\_NAD\_000 – **provided by M5**.
* Closing\_Cash\_NAD\_000 – **added** by M7.5B (rolled).
* Cash\_and\_Cash\_Equivalents\_NAD\_000 – **added** to M7.5B BS (= closing cash).

Synonyms and auto‑resolution rules for upstream discovery are documented in code and validated by smoke.

**7) Warnings & expected messages**

* **Freeze choice file not found** → a one‑line warning; shim defaults to A\_SAFE / equity\_like.
* **Negative closing cash would occur** → not applicable when the buffer is ≥ 0 and the gate is enabled; otherwise flagged at smoke time.
* **Role missing** → run M5 first; M7.5B will fail in strict=True if M5 roles are absent.

**8) Repro commands (PowerShell one‑liners)**

Run **M5** (if not already up to date):

$env:PYTHONPATH="C:\TerraNova\src"; .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m5\_cash\_flow.runner import run\_m5; run\_m5(r'.\outputs','NAD', strict=$true)"

Run **M7.5B**:

$env:PYTHONPATH="C:\TerraNova\src"; .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m7\_5b\_rebuild.runner import run\_m7\_5b; run\_m7\_5b(r'.\outputs','NAD', min\_cash\_buffer\_nad\_000=0.0, strict=$true)"

Optional – **M8.A super‑verification**:

$env:PYTHONPATH="C:\TerraNova\src"; .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m8A\_verifier.runner import run\_m8A; run\_m8A(r'.\outputs','NAD', input\_pack\_path=r'.\InputPack\TerraNova\_Input\_Pack\_v10\_0.xlsx', strict=$true, diagnostic=$true)"

**9) References**

* M7.5B runner implementation (freeze shim, gate, roll, emissions).
* IFRS 18 – aggregation/disaggregation; direction of interest/dividend classification changes; structured summaries.
* KPMG *Statement of Cash Flows* handbook – debt financing flows, interest bifurcation (operating vs financing) and indirect method presentation.

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## 2) `docs/m7\_5b\_runbook\_and\_ci.md`

```markdown

# M7.5B – Runbook & “Poor‑Man’s” CI

This runbook standardizes how we (re)build M7.5B artifacts and verify the core invariants with smoke tests. It assumes a Windows shell with PowerShell and a local venv at `.venv/`.

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## 0) Pre‑flight

- Repo bootstrapped; `.venv` created; dependencies installed.

- `outputs\` contains the upstream artifacts (`m0\_\*.parquet`, `m5\_cash\_flow\_statement\_final.parquet`, etc.).

- Ensure `PYTHONPATH` points to `src`.

```powershell

$env:PYTHONPATH="C:\TerraNova\src"

**1) Build order (idempotent)**

1. **M5** – assembles the cash flow roles that M7.5B depends on:
2. .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m5\_cash\_flow.runner import run\_m5; run\_m5(r'.\outputs','NAD', strict=$true)"

Expected: m5\_cash\_flow\_statement\_final.parquet, m5\_smoke\_report.md.

1. **M7.5B** – rebuilds P&L, CF, BS with junior gate and closing cash roll:
2. .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m7\_5b\_rebuild.runner import run\_m7\_5b; run\_m7\_5b(r'.\outputs','NAD', min\_cash\_buffer\_nad\_000=0.0, strict=$true)"

Expected: m7\_5b\_cash\_flow.parquet, m7\_5b\_balance\_sheet.parquet, m7\_5b\_profit\_and\_loss.parquet, plus m7\_5b\_debug.json, m7\_5b\_smoke\_report.md.

1. **(Optional) M8.A** – cross‑module super‑verification:
2. .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m8A\_verifier.runner import run\_m8A; run\_m8A(r'.\outputs','NAD', input\_pack\_path=r'.\InputPack\TerraNova\_Input\_Pack\_v10\_0.xlsx', strict=$true, diagnostic=$true)"

**2) What the smoke tests check**

* **BS tie:** Total\_Assets == Total\_Liabilities\_And\_Equity (within tolerance).
* **Cash link:** CF Closing\_Cash\_NAD\_000 equals BS Cash\_and\_Cash\_Equivalents\_NAD\_000.
* **M5 role integrity:** CFO/CFI/CFF present and numeric; Month\_Index contiguous.
* **Negative cash guard:** With min\_cash\_buffer\_nad\_000 ≥ 0, closing cash should never be negative.
* **Freeze choice:** If outputs\m7\_selected\_offer.json is absent, a single shim warning is expected; otherwise, the file is parsed and logged.

All results are collated in m7\_5b\_smoke\_report.md and m7\_5b\_debug.json. Implementation details live in src/terra\_nova/modules/m7\_5b\_rebuild/runner.py.

**3) Artifacts to expect**

* **Cash flow:** m7\_5b\_cash\_flow.parquet (includes Closing\_Cash\_NAD\_000)
* **Balance sheet:** m7\_5b\_balance\_sheet.parquet (includes Cash\_and\_Cash\_Equivalents\_NAD\_000)
* **Profit & loss:** m7\_5b\_profit\_and\_loss.parquet
* **Debug & smoke:** m7\_5b\_debug.json, m7\_5b\_smoke\_report.md

**4) Common failures & how to triage (no patching)**

1. **Missing M5 roles (CFO/CFI/CFF)**  
   Rebuild M5 and re‑run M7.5B (do **not** tunnel defaults in M7.5B).
2. .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m5\_cash\_flow.runner import run\_m5; run\_m5(r'.\outputs','NAD', strict=$true)"
3. **Opening cash not found in M0**  
   Check m0\_opening\_bs.parquet has Line\_Item='Cash' and Month\_Index. (M7.5B fails in strict mode to protect accounting integrity.)
4. **Freeze selector not present**  
   Expected single warning + shim default. If you need a specific classification, emit outputs\m7\_selected\_offer.json.
5. **Negative closing cash**  
   Increase min\_cash\_buffer\_nad\_000 **or** revisit M5 drivers (CFO/CFI/CFF). The gate injects junior cash only up to the buffer; it won’t mask structurally unviable scenarios.

**5) One‑liners (copy/paste)**

$env:PYTHONPATH="C:\TerraNova\src"; .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m5\_cash\_flow.runner import run\_m5; run\_m5(r'.\outputs','NAD', strict=$true)"

$env:PYTHONPATH="C:\TerraNova\src"; .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m7\_5b\_rebuild.runner import run\_m7\_5b; run\_m7\_5b(r'.\outputs','NAD', min\_cash\_buffer\_nad\_000=0.0, strict=$true)"

$env:PYTHONPATH="C:\TerraNova\src"; .\.venv\Scripts\python.exe -c "from terra\_nova.modules.m8A\_verifier.runner import run\_m8A; run\_m8A(r'.\outputs','NAD', input\_pack\_path=r'.\InputPack\TerraNova\_Input\_Pack\_v10\_0.xlsx', strict=$true, diagnostic=$true)"

**6) References**

* Runner and smoke logic for M7.5B.
* IFRS 18 – presentation principles, aggregation/disaggregation; direction of interest/dividend classification.

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### Anything else you want documented?

If you’d like, I can also add a short `docs/m5\_cash\_flow\_contract.md` (role contract & synonym resolution) to ensure upstream stays stable—just say the word and I’ll draft it in the same copy‑paste style.