**Story B — “Material Alignment: Assign Codes to Materials, Safely & at Scale”**

**Intent (one line)**

Map provider classification codes to your **Material Master** with **assisted automation**, human control, and full lineage—so every item has a defensible ECCN/HS that downstream rules can trust.

**Actors**

* **Material Syncer** (ingests materials from ERP/OMS)
* **Classifier Assistant** (suggests ECCN/HS based on provider taxonomy)
* **Reviewer (Compliance)** (approves/edits)
* **Audit Vault**

**Preconditions**

* Materials synced (id, description, specs, origin, UoM).
* Story A snapshots ACTIVE with searchable indexes.
* Roles & workflow (Reviewer/Approver) configured.

**Happy Path**

1. **Material Intake**
   * Receive/refresh materials from SME systems (Shopify/QBO/Zoho Inv./ERP).
   * De-duplicate across sources; create/merge a **golden material** record.
2. **Automated Suggestions (Assistive)**
   * **Classifier Assistant** proposes codes:
     + **ECCN** candidates (top-k) via keyword/spec match against Classification Index.
     + **HS/HTS** by description + product attributes; can filter by destination market (US HTS/EU CN).
   * Each suggestion includes **confidence**, matched code text snippets, and **snapshot\_id**.
3. **Human Review**
   * Reviewer sees:
     + Suggested codes + rationale (highlighted text)
     + **Correlation Graph** hints (e.g., ECCN suggests likely HS headings)
     + **Ambiguity meter** (if multiple close matches)
   * Reviewer selects code(s), adds notes, and **approves**.
   * Optionally tag **“dual-use”** and **end-use sensitive** flags.
4. **Version & Lock**
   * Material gets **Classification Version** record:
     + eccn, hs/hts, authority, snapshot\_id, reviewer, approved\_at, notes.
   * Downstream sees only the **latest approved** version.
5. **Propagation**
   * Publish MaterialClassified event:
     + Includes codes, snapshot lineage, and **correlation hints** for rules engine.
   * Existing **open transactions** for this material are queued for **license determination refresh**.

**Failure / Alternate Flows**

* **No High-Confidence Match:** Material marked **REVIEW** with a **What-to-Add** hint (e.g., “Add alloy content / % cobalt to disambiguate 3A001 vs 3A002”).
* **Conflicting Approvals:** Dual control rule—if two reviewers disagree, escalate to Approver role.
* **Change in Taxonomy:** New snapshot deprecates a code → **Impact Preview** shows affected materials; bulk review workflow available.

**Acceptance Criteria**

* Each material’s classification shows **who/when/why** and **which snapshot** supported it.
* Suggestions present **evidence** (text snippets), not just codes.
* Revisions create new **Material Classification Versions**; history is immutable & searchable.
* Transactional re-evaluation triggers automatically on classification change.

**Innovation**

* **Ambiguity Meter** + **What-to-Add Hints** (reduce back-and-forth)
* **Correlation-aware suggestions** (ECCN drives HS shortlist and vice versa)
* **Bulk Assisted Review** without losing per-item evidence