



# CM+ Enterprise CMII Profile

## *CMII for Software*



# About Neuma Technology



- Enterprise SCM/ALM tool vendor since 1990
- CM+ Enterprise: Flagship Product
- Mission-Critical and Long Term S/W Projects
- The only Full 4<sup>th</sup> Generation Technology
- Industry's only CMII Certified SCM tool

# Some of our Customers



National Défense  
Defence nationale



- DND CSES/Lockheed Martin
- DoD/USAF F15 - Northrop Grumman
- Thales (Formerly Thomson CSF)
- CyberKinetics Neurotechnology
- Nortel Networks (Canada, India)
- Liebherr Aerospace GmbH
- DRS Technologies (SPAR Aerospace)
- Bookham Technology (Canada, U.K.)
- Fujitsu Network Communications
- ADVA Optical Networks (Texas, China)
- AMEC - TGPMS (China)



**LIEBHERR**



# CMII for Software: CM+

Neuma CM+ 6.0 cp100

File Edit Context Users Products Requests Meetings Requirements Activities Testcases Updates ECNs Process Administrator Help

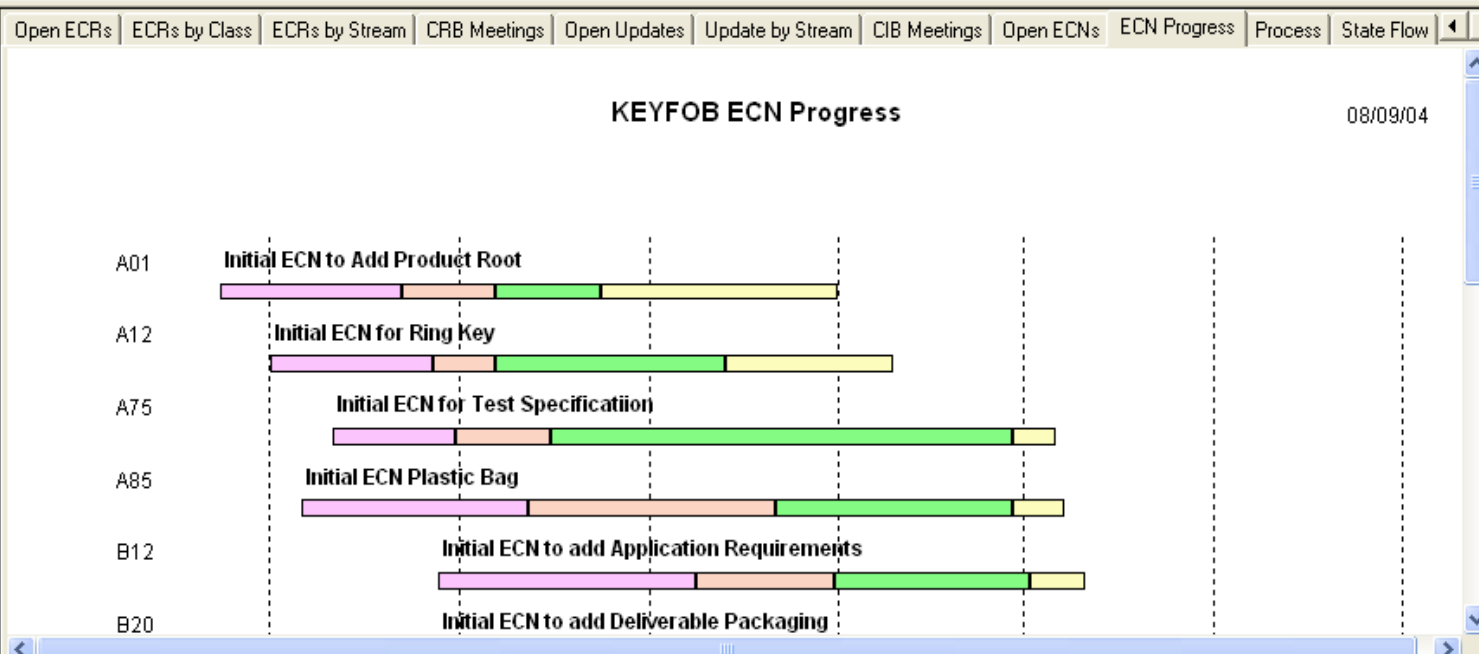
Search: All ECNs (15) [title] Clear

| ECN | cs2    | product | stream | status    | type     | prevecn | baseline          | meeting | title  | effe |
|-----|--------|---------|--------|-----------|----------|---------|-------------------|---------|--|------|
| D02 | farah  | KEYFOB  | rel1   | Allocated | internal | D01     | \$\$\$KEYFOB.aa02 | -       | Quick Fixes to Control Codes Table             | -    |
| D01 | farah  | KEYFOB  | rel1   | Allocated | internal | C54     | \$\$\$KEYFOB.aa02 | -       | Addition of KEYFOB Software Into CM Repository | -    |
| C54 | cm2mgr | KEYFOB  | rel1   | CIB       | internal | C48     | \$\$\$KEYFOB.aa02 | mtg.9   | Software Upgrade for PROM Chip                 | -    |
| C48 | cm2mgr | KEYFOB  | rel1   | Released  | release  | C35     | \$\$\$KEYFOB.aa02 | mtg.7   | Double Capacity Prom Chip                      | 07/  |
| C35 | cm2mgr | KEYFOB  | rel1   | Completed | internal | C00     | \$\$\$KEYFOB.aa01 | mtg.8   | Battery Lifetime Upgrade                       | 07/  |
| C00 | cm2mgr | KEYFOB  | rel1   | Closed    | release  | B65     | \$\$\$KEYFOB.aa01 | mtg.3   | Baseline Prior to New ECNs                     | 07/  |
| B65 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B50     | \$\$\$KEYFOB.aa00 | mtg.0   | Initial ECN Transister Assembly                | 07/  |
| B50 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B25     | \$\$\$KEYFOB.aa00 | mtg.0   | Initial ECN to Add Parts                       | 07/  |
| B25 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B20     | \$\$\$KEYFOB.aa00 | mtg.0   | Initial ECN for Bill of Materials              | 07/  |
| B20 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B12     | \$\$\$KEYFOB.aa00 | mtg.0   | Initial ECN to add Deliverable Packaging       | 07/  |
| B12 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | A85     | \$\$\$KEYFOB.aa00 | mtg.0   | Initial ECN to add Application Requirements    | 07/  |
| A85 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | A75     | \$\$\$KEYFOB.aa00 | mtg.0   | Initial ECN Plastic Bag                        | 07/  |

Open ECRs | ECRs by Class | ECRs by Stream | CRB Meetings | Open Updates | Update by Stream | CIB Meetings | Open ECNs | ECN Progress | Process | State Flow

### KEYFOB ECN Progress

08/09/04



The Gantt chart displays the progress of several ECNs across different streams. The streams listed are A01, A12, A75, A85, B12, and B20. Each stream has a horizontal bar representing the duration of the ECN process, divided into segments of different colors (pink, orange, green, yellow). The bars are labeled with their respective titles: 'Initial ECN to Add Product Root' (A01), 'Initial ECN for Ring Key' (A12), 'Initial ECN for Test Specification' (A75), 'Initial ECN Plastic Bag' (A85), 'Initial ECN to add Application Requirements' (B12), and 'Initial ECN to add Deliverable Packaging' (B20). Vertical dashed lines indicate key milestones or dates throughout the timeline.

Library Server Not Running

User: farah Product: KEYFOB Stream: Update: - Dir: C:\temp\sts LCD: /

# H/W and S/W Differences

---

- S/W is designed to change “easily”
- H/W production/delivery: big \$\$\$ - S/W near \$0
  - S/W production via automated build process
- Typically 1000s to 10,000s S/W files per project
- S/W quantity always 1; S/W functions “shared”
- Virtual test labs – no delay: more iterative design/test cycle
- Unlike H/W, S/W is stored in the CM repository
- Software is human-readable source code which is compiled/linked into executable parts

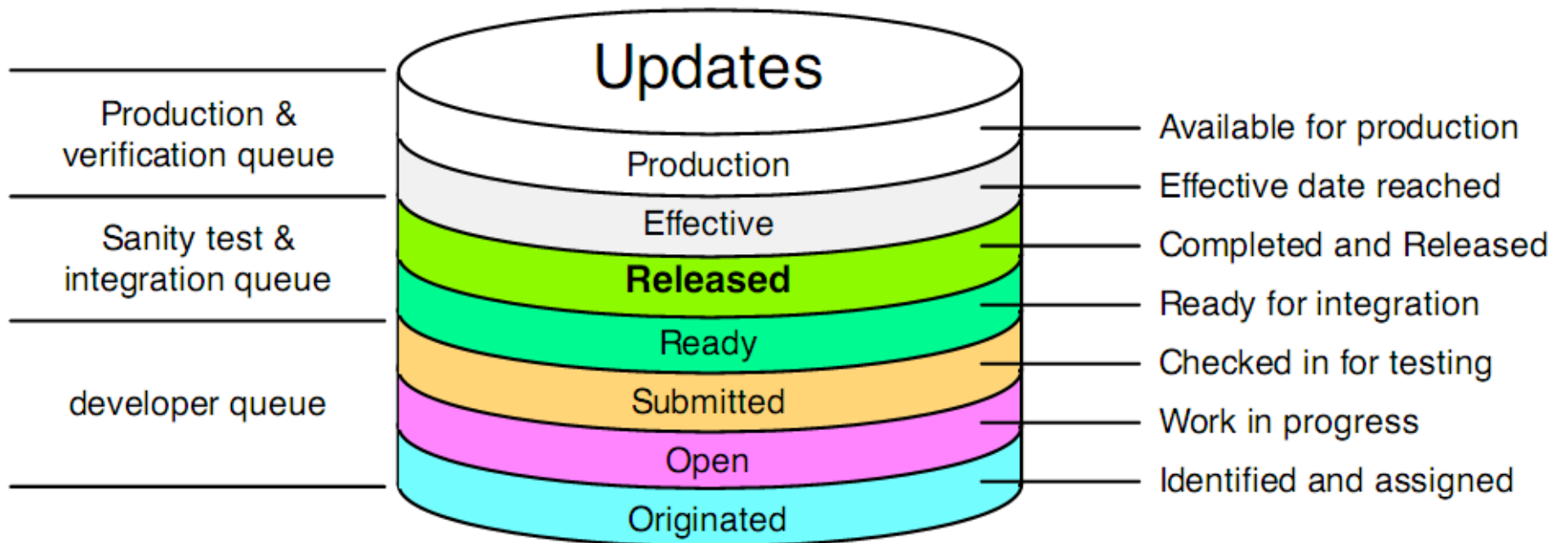
# Key Software Concepts

- **Update:** Package of (related) impacted items for an ECR
  - i.e. What needs to be changed (later becomes “What changed”)
  - Functionally group ECR tasks into one or more Updates
  - 10s to 100s of updates per day is typical in a S/W project
- **Build:** Notice (becomes record) of change content = ECN.
  - Artifacts (deliverable) also called “build”, as is “build” process.
  - Created regularly (e.g. Nightly) to support development/test
- **Parallel** development common: branching, merging...
- **Workspace** is a virtual full-product test lab for a developer
- **Unit Test:** Build/Test of Update (i.e. unit of change) typically required (in workspace) before checkin to repository!
- **Promotion Levels:** CMII: in Repository = released.
  - In S/W other repository states allow data into repository prior to CS3 sign-off (e.g. for peer review, development builds, etc.)



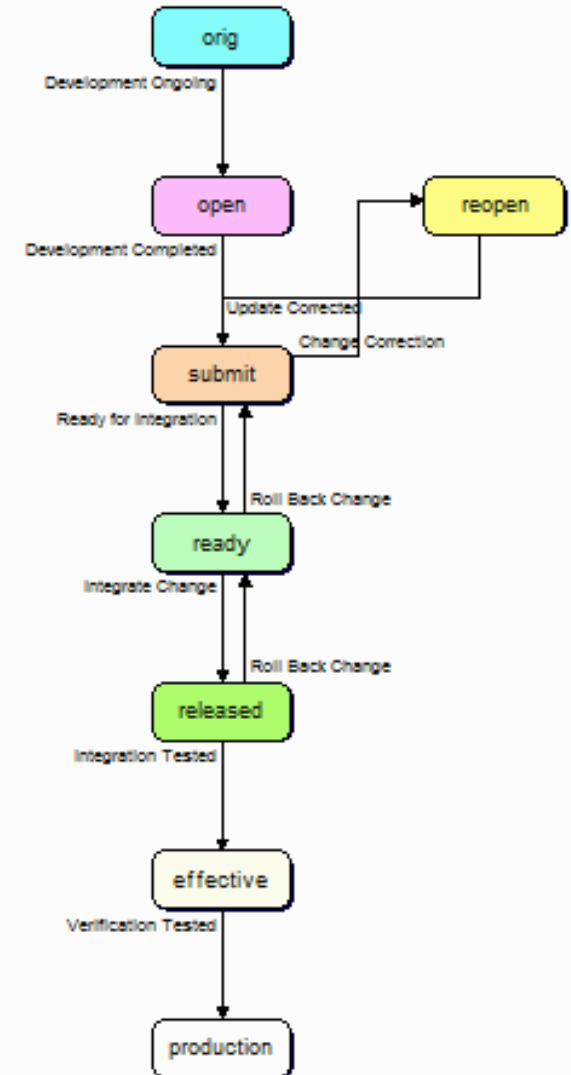
# Promotion Levels

## "Layered Repository"



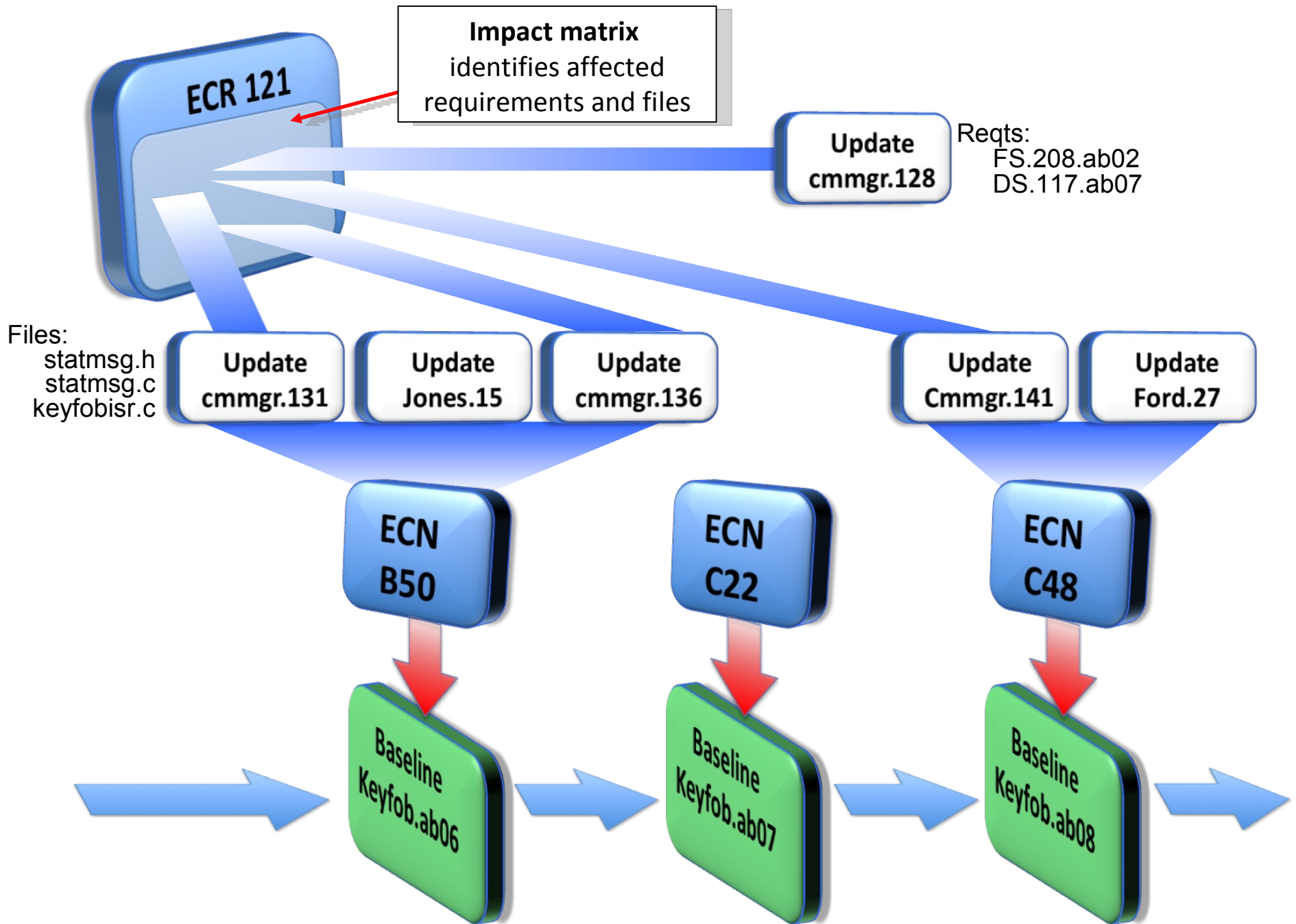
# State Flow: Automation

- States and Transitions are key to ensuring Business Rules are followed
- The states are the promotion levels!
  - Each entity type has its own states/flow
- Rules, triggers, permissions/roles guard transitions. States drive to-do lists.
- These Business Rules allow automation
  - Frees up developers/managers
  - Reduces overhead
  - Increases Quality of Product and Data
  - Automates traceability
- In CM+ Color-coding states gives visual feedback in charts and data





$$\text{Impact Matrix} = \sum_{\text{ECR}} \text{Updates}$$



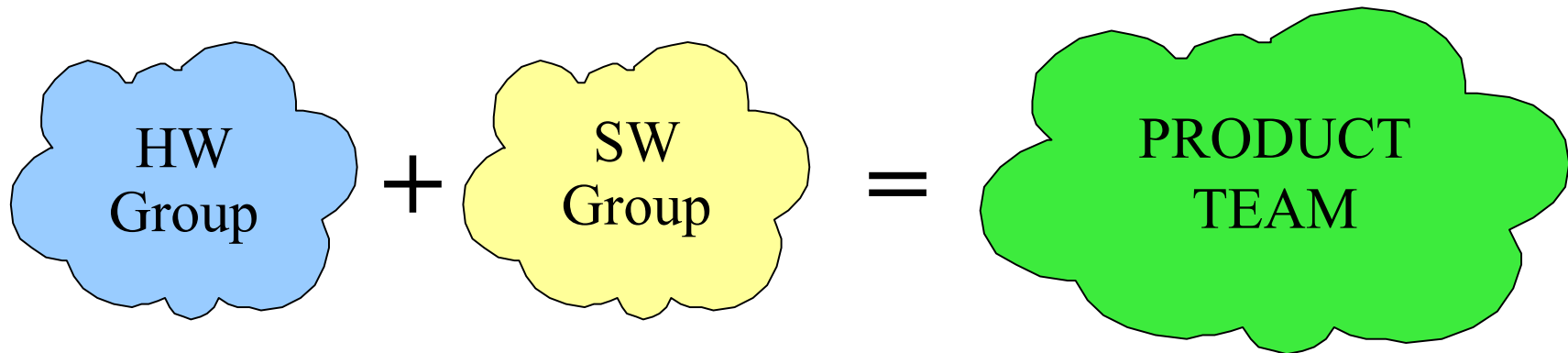
# CMII Concepts and Software

---

- Basic CMII Process is the same for H/W and S/W
- DCRs for software are automatically generated
- ECNs: Defined in Support of registered Builds
- ECN = Set of Updates + Previous Baseline => New Baseline
- Fast tracked ECR usually does not map onto a single ECN
  - Multiple fast tracked ECRs are put into a single fast-tracked ECN
- S/W is pure function, grouped into logical items (files)
- ECR Impact matrix: requirements impacted; software items impacted - collected into Updates (a.k.a. change packages)

# CMII Helps S/W Process

- Ensures traceability of code back to requirements
- Helps to perform impact analysis
- Establishes formal records (ECNs) for builds
- Baseline View gives Visual “delta” of Software Progress
- Enables S/W & H/W teams to understand each other





# How does CM+ Help CMII

---

- Allows better visibility of CMII Process/Roles
- Use of Updates to formally track impact matrix
- Automation of DCRs for Software items
- Extends “repository” state with Promotion Levels
- Tracking of CRBs, CIBs and other meetings
- Users can identify assigned actions/tasks
- Interactive Dashboards, Charts, Traceability
- End-to-end CMII process/data management



# CM+ Demonstration



# Neuma's CM+ 4G Advantage

---

- ✓ CMII Certified for Software
- ✓ Low-risk/cost Evaluate/Deploy
- ✓ Out-of-the-Box CMII Process
- ✓ Easily Customized Process/UI
- ✓ CM Automation
- ✓ High Performance, Scalable
- ✓ Enduring Architecture
- ✓ End-to-end Seamless Integration
- ✓ Near-zero Administration
- ✓ Mission-critical Reliability
- ✓ Small Cross-platform Footprint
- ✓ Effortless CM+MultiSite
- ✓ Warm-standby Disaster Recovery
- ✓ Enterprise-wide Data Visibility
- ✓ ITAR Data Segregation
- ✓ Instant Traceability, Drill Downs
- ✓ Dynamic Dashboards, Charts
- ✓ Advanced Query/Reporting
- ✓ Role-based To-Do Lists, Tabs
- ✓ SCM Industry Leadership



# Neuma Advantage

---

- ✓ Over 20 years of Software CM Expertise
- ✓ 4<sup>th</sup> Generation Enterprise SCM Technology
- ✓ Solutions easily tailored to each environment
- ✓ Reliability/availability for mission-critical operation
- ✓ SCM Leadership: Change packages, streams, seamless integration, synchronous multi-site, CMII support, ...
- ✓ Responsive to customer needs
- ✓ Focus on minimizing your cost and risk



# Software Productivity Factors: CM+

---

## **Developer**

- Bulkload and automatic change creation
- Easy context view changes – stream-based operation
- Change-based operations, including merge change
- Powerful browsing tools: history, sub-tree comparison, ...
- Active workspace support, and source search
- Eliminates complex branch/merge strategies

## **CM Manager**

- Elimination of Labeling, promotion branching
- Minimized branching/merging
- Easy promotion, roll-back, baseline creation
- Automation of nightly builds + ECN tracking/comparison

# Cost Factors - TCO

---

## Total Cost of Ownership – Key factors

- Administration – how many support staff needed
- Training – course cost + loss of time (salary cost)
- Customization – Ease of customization
- CM License costs including upgrades
- Cost of additional ALM tools/upgrades
- Integration of ALM functions – Glue cost/maintenance
- Cost of problems/down-time
- Easy of Use: Tool Productivity vs. Tool Overhead
- Annual maintenance

# Flexible Status Reporting

---

- Interactive query with point-and-click traceability
- Drill-down summaries and graphs/charts
- Configurable, dynamic management dashboards
- Custom Colour Hi-Lites for Data, Charts, Graphs, ...
- Hierarchical data navigation (WBS, SW Tree, etc.)
- In-boxes/To-do lists custom to each role/user
- Role-based tabs for quick navigation
- Pre-canned, customer-defined, and custom reports
- Formats: Text, XML, HTML, Spreadsheet, Graphics
- Interactive: Tables, Panels, Forms, Trees, Graphs, etc.

# Rapid Report Tabs/To-Do

Neuma CM+ 6.0 cp100

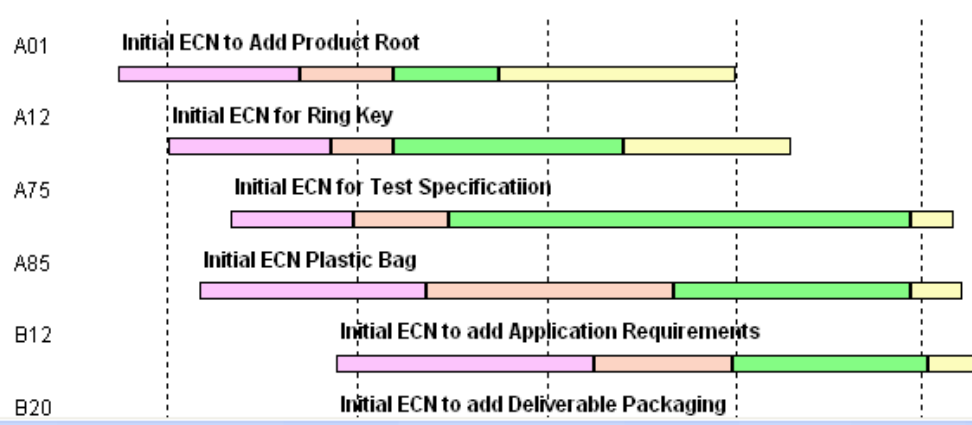
File Edit Context Users Products Requests Meetings Requirements Activities Testcases Updates ECNs Process Administrator Help

All ECNs (15) title Clear

| ECN | cs2    | product | stream | status    | type     | prevecn | baseline        | meeting | title  | effe |
|-----|--------|---------|--------|-----------|----------|---------|-----------------|---------|--|------|
| D02 | farah  | KEYFOB  | rel1   | Allocated | internal | D01     | \$\$KEYFOB.aa02 | -       | Quick Fixes to Control Codes Table             | -    |
| D01 | farah  | KEYFOB  | rel1   | Allocated | internal | C54     | \$\$KEYFOB.aa02 | -       | Addition of KEYFOB Software Into CM Repository | -    |
| C54 | cm2mgr | KEYFOB  | rel1   | CIB       | internal | C48     | \$\$KEYFOB.aa02 | mtg.9   | Software Upgrade for PROM Chip                 | -    |
| C48 | cm2mgr | KEYFOB  | rel1   | Released  | release  | C35     | \$\$KEYFOB.aa02 | mtg.7   | Double Capacity Prom Chip                      | 07/  |
| C35 | cm2mgr | KEYFOB  | rel1   | Completed | internal | C00     | \$\$KEYFOB.aa01 | mtg.8   | Battery Lifetime Upgrade                       | 07/  |
| C00 | cm2mgr | KEYFOB  | rel1   | Closed    | release  | B65     | \$\$KEYFOB.aa01 | mtg.3   | Baseline Prior to New ECNs                     | 07/  |
| B65 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B50     | \$\$KEYFOB.aa00 | mtg.0   | Initial ECN Transister Assembly                | 07/  |
| B50 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B25     | \$\$KEYFOB.aa00 | mtg.0   | Initial ECN to Add Parts                       | 07/  |
| B25 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B20     | \$\$KEYFOB.aa00 | mtg.0   | Initial ECN for Bill of Materials              | 07/  |
| B20 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | B12     | \$\$KEYFOB.aa00 | mtg.0   | Initial ECN to add Deliverable Packaging       | 07/  |
| B12 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | A85     | \$\$KEYFOB.aa00 | mtg.0   | Initial ECN to add Application Requirements    | 07/  |
| A85 | cm2mgr | KEYFOB  | rel1   | Closed    | internal | A75     | \$\$KEYFOB.aa00 | mtg.0   | Initial ECN for Test Specification             | 07/  |

Open ECRs | ECRs by Class | ECRs by Stream | CRB Meetings | Open Updates | Update by Stream | CIB Meetings | Open ECNs | ECN Progress | Process | State Flow

**KEYFOB ECN Progress** 08/09/04



Library Server Not Running

User: farah Product: KEYFOB Stream: Update: - Dir: C:\temp\sts LCD: /

# Project Dashboard

