PIR - PLM non prod data sent to downstream systems

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Incident/ Problem Reference: 90702974/ 72270

Incident Reported Date: 02/04/2025

Incident Resolved Date: 07/04/2025

PIR Date: 10/04/2025

Author: Saloni Chowdhury

Status: Draft Version ⚠️

Attendees:

George Loizou; Vinay Yadav (PTC); Debra Houston; Lorraine Gordon; Ganesan Sampath; sathwik kaliki; Ashok Gunasekaran; WS.5E.07 POD Seats 6; Alan Holder (PTC); Joanna Lacy; Kartikye Guleria (PTC); Joanna Lacy; James Browning; Francis Burt; Amritendu Nayak; Sahil Sapar; Karthikeyan Mariappan; Kiran Kari (PTC); Pawankumar Manjunathan; Anusha Nayak; Ben Fysh; Gokula Krishnan; Saloni Chowdhury

Technical Owner: Anusha Nayak/ Naresh Mandadapu

PIR Reviewer: Debra Houston/Beth Forbes

1. Incident Summary :

On 2rd April 2025, the CHDS team discovered that the PLM non-production environment had been transmitting data/messages to downstream production systems (CHDS, SAP, EDW, Range Planner, IBT, SSI), This resulted in incorrect product data being updated in live systems, posing a severe risk to data integrity and business operations.

M&S use the PTC FlexPLM application for Product Development for Clothing, Home and Beauty products. We have 5 additional non-Production environments. Whilst analysing Production related incident data, the C&H Domain Service team identified that non-Production data was reaching the live C&H Domain Service and being shared with live downstream applications.

The live FlexPLM environment was taken down whilst we analyzed the extent of the situation. We identified product data that was impacted as well as identifying remedial actions. FlexPLM was brought back online when we were confident that the non-Production connections had been turned off to allow business users to continue with critical tasks.

Evidence of issue detection: RP Team reported an issue mentioning it received a PLM article with the hierarchy item of state which is before the major restructuring (i.e. over-writing the latest production updates). Upon investigation, PLM Team identified that the stipulated data triggered from PLM non-production system.

(👤 Sampath, Ganesan) to provide the actual message reference through which the issue was identified as an artifact.

Technical Impact:

Below are the interfaces impacted due to the incorrect property setting that led non-production data being sent over to Production downstream systems**.**

I0575 - Landed Cost Price Call-out

I1111 - Article Create/Update to SAP

I0568 - Adopted Options,

I0599 - Seasonality

I0566 - Reserve Article Number (There is no data corruption as this interface only supplies the next available article number to PLM)

Business Impact

- Colleagues were seeing cost prices changing, overriding the updates they had put in which could affect margin calculations

- Colleagues were seeing product status changes e.g. Approved to Adopted or Adopted to Approve that they knew they had not made. This means that products were not flowing through systems when they should.

- Some products were stuck in certain stages of the supply chain if they were not in finalized status

- Colleagues were taking remedial actions but seeing them overridden after correction.

2. Incident Chronology :

👉 *Include a record of the data/time of key events. e.g. "07:36 Incident started, notified by ..."* ***keep fact based"***.

02/04 - Wednesday

11:00 – CHDS raised to PLM that there are unidentified articles that are coming to CHDS.

11:30 – Upon investigation PLM identified that PLM Non-Prod is connected to CHDS. MIM bridge was initiated.

12:30 – PLM is brought down to minimize impact on downstream

20:10 – Decision to bring up PLM within restricted usage since it was understood that PLM data in prod is most up-to-date. PTC is requested to provide a list of impacted articles and impacted interfaces. PTC Shared that there were 4 impacted interfaces (I0568, I1111, I0575 and I0599) with the list of impacted articles as (I0568 and I1111 ~1300, I0575 – 61, I0599 ~ 11200)

03/04 - Thursday

9:00 – to resolve the issue there was a request to PTC to provide a comparison of the impacted articles season status which is currently reflecting on prod vs the article season status which is reflecting on non-prod as impacted the interfaces. This would determine the next course of action interface by interface. I0568 and I1111 interfaces being the highest Impacted interfaces were prioritized to be resolved first.

11:00 – PTC team worked with M&S (TCS) team to get additional clarifications. Detailed document outlining steps was prepared by M&S (TCS) teams and shared with PTC

13:00 – M&S (TCS) team worked on approach for remedial actions once the impacted list of articles comparison from non-prod to prod were available from PTC and reviewed it with business teams

15:00 – PTC team reported they were working on extracts. Daryl from M&S was engaged to help with extracts consolidation

17:00 – PTC team reported they were still working on extracts and comparison

17:30 – Decision from business to allow business PLM system usage without any restrictions

19:00 – PTC team share extracts but were incorrect. M&S (TCS) team explained the ask and shared clear expectations of the extract

needed

PTC team worked overnight on the extracts and comparison needed

04/04 - Friday

06:00 – PTC team shared the reports and data with M&S (TCS) team for review. M&S (TCS) team provided instructions to rework

08:00 – PTC team shared revised reports and comparison. M&S (TCS) team and PTC team worked together on the data correction plan and count consolidation

09:00 – Plan was presented to wider team on MIM bridge and actions were taken for resolution. PTC and M&S(TCS) teams worked further on detailing what was needed and to prepare for republish

11:00 – Republishes started with I0568 data (Manual)– once the data reached respective systems (RP, CHDS – individual system owners verified if the data reached the systems and confirmed back)

13:00 – Republished started for I1111 data (Automated) – once the data reached respective systems (SAP – individual system owners verified if the data reached the systems and confirmed back)

15:00 – Republishes and audit checks continued

17:00 – Failed articles collated which needed business corrective actions. Impact checked for I0599 and established no action needed

18:00 – Next course of action identified for I0575 interface. Decision that the damage has been 90% contained and no weekend support needed

07/04 – Monday

09:00 – LCP call outs to be done for I0575 impacted articles shared with business to confirm whether call out can be perform to fix this. Business agreed

11:00 – Call outs performed and resolved. 9 unresolved impacted articles shared with business for corrective actions

13:00 – Decision - corrective actions for 9 impacted articles performed by business to be continued as a regular BAU incident.

3. Incident Resolution

- *Non-Production property files have been modified to point to non-prod downstream system.*

- *Compared production data with non-production data* and arrived at the articles that need to be fixed based on the mismatch in the season status.

- *Impacted articles have been re-triggered from Production from appropriate interfaces to ensure latest data available in downstream systems*

4. Root Cause

Brief Summary: Vendor PTC performed data rehosting activity of the non-prod PLM environments (VPT and SIT) on July 31st 2024 and March 13th 2025. During the activity, a production environment property name - **MS_ENVIRONMENT_NAME=PROD** was mistakenly used, causing non-prod PLM data to be sent to downstream production systems.

Detailed Summary:

PLM VPT and SIT Training servers were Refreshed & Rehosted on July 31st, 2024 and Mar 13th, 2025 respectively.

Below is the property entry present in **Windchill/codebase/custom.lcs.properties** file and during the Rehost Process entire Windchill (application) folder will be taken from Production and be placed in the non-prod server and set of manual steps will be followed to reset the production related properties to point back to non-production server.

There isn't a step to check and modify the below property to point to appropriate non-production server

MS_ENVIRONMENT_NAME=PROD

Ideally, it should be as below post Refresh & Refresh for VPT & SIT respectively

MS_ENVIRONMENT_NAME=VPT

MS_ENVIRONMENT_NAME=SIT

Due to the above setting, which was pointing to Production, the data which were created/updated/sent since August 1st, 2024 in the PLM Non-Prod VPT environment, were landed in live M&S systems via the C&H Domain Service, Range planner, EDW, SAP

Since Mar 13th, 2025, the PLM Non-Prod SIT Training environment was sending test data to live M&S systems via the C&H Domain Service, Range planner, EDW, SAP

Key contributing factors include:

PLM Non-Prod Was Sending Data to Downstream Prod Systems

    a. Misconfigured integration points allowing non-prod data to flow into prod.

    b. Lack of environment-based access control in middleware/APIs

2. **No Environment Separation Safeguards in CHDS & Other Systems**

    a. CHDS, SAP, or other downstream system did not block the messages based on source environment

    b. Non-prod PLM updates were processed as if they were real prod updates.

3. **Inadequate Change Management for PLM Data Refreshes**

    a. No validation process before/after refreshing PLM prod data into lower environments.

    b. No automated checks to detect and stop non-prod data from entering prod systems.

5. Findings

5.1. Observability –

There was a spike in incidents over time, but lack of collaboration and cross-functional ownership delayed root cause identification. Incidents were treated in isolation, and PTC couldn't find commonality. The service lead will now own incident analysis post re-hosting, correlating incident trends. A monthly data review is in place, TCS is handling P3/P4s, and PTC is focused on P1/P2s. Feasibility of alerting within PTC and presence of non-prod data in the downstream systems is currently being explored.

(👤 Loizou, George) to provide the incident trend to prove the spike in incident count.

5.2. Technical Challenges -

- The bulk re-trigger script from PLM to downstream systems was not readily available, causing delays in the recovery process.

- Additionally, both prod and non-prod PLM IPs are whitelisted on the M&S prod side, which needs review for proper segregation. Work is in progress to enforce strict environment segregation via API gateways or message filtering, including exploring mandatory source environment fields or quarantining non-prod messages in the non-prod systems

5.3. MIM involvement & impact assessment -

- The incident was initially posted in the support channel as the scope of impact was unclear. Once it became evident that non-prod data was involved and the impact was major, PLM was made unavailable to prevent further issues.

- Due to lack of proper impact assessment, the incident was not immediately classified as a major incident. The MIM team later intervened proactively, and the correct MIM process was followed.

- Impact assessment was delayed due to confusion within the PTC team regarding requirements, especially around the count of impacted articles across four interfaces. The process was manual, lacking automation, and it took over a day to provide a detailed impact breakdown by season, department, etc., which delayed recovery actions.

5.4. Incident handling/ stakeholder management –

While collaboration across teams was efficient, support from PTC was inadequate, with only one person to assist with impact assessment. This limitation was escalated to M&S leadership, and a service review with PTC has been completed. Further clarity is needed on the approach to improve support engagement going forward.

5.5. Business Communication –

In this incident, business and colleague communications were well-handled, with clear updates and proper instructions provided to PLM users after the application was made available on 3rd April, including guidance on restricted functionalities. However, feedback was received that the tech communications were too technical. This has been acknowledged, and service lead has committed to ensuring future comms are written in more business-friendly language.
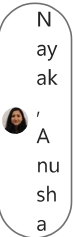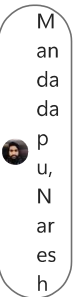
5.6. Supplier Engagement –

Support from PTC was inadequate, with only one person to assist with impact assessment. This limitation was escalated to M&S leadership, and a service review with PTC has been completed. Further clarity is needed on the approach to improve support engagement going forward.

Mitigation Actions:

	Action	Owner	🗓 Due Date	Remarks	Action Category
1	Review the process involved in the rehosting activity performed by PTC. Improve post validation steps during rehost/deployment/patch installation activities	Nayak, Anusha Kiran Kari	Thu, Apr 24, 2025	A comprehensive review of the rehosting process will be conducted jointly with PTC to identify gaps and opportunities for improvement, ensuring future activities are handled without impacting production.	Problem Avoidance
2	Initiate an assessment to determine the need for data classification in the PTC rehosting.	Rai, Saurabh	Thu, Apr 24, 2025	It was observed that production data was transferred to a non-production environment as part of the rehosting activity, resulting in challenges identifying issues when this data propagated to downstream systems. To address this, a review will be conducted to explore the implementation of data classification techniques such as masking or indexing.	Problem Avoidance
3	For all future PTC rehosting activities, the M&S PLM team will raise an informative change to ensure additional sanity checks are performed post-activity with downstream systems.	Houston, Debra	Thu, Apr 10, 2025	It has been agreed with the Product Owner and TPMs that, moving forward, an informative change will be initiated by the M&S PLM team during any PTC rehosting activity.	Problem Avoidance

| 4 | Collaborate with cross-functional teams to evaluate the feasibility of implementing validations that can block incoming data feeds from unintended sources—such as non-prod PLM—across CNH domain services, including SAP, EDW, and Range Planner. | Nayak, Anusha Mandadapu, Naresh Mariappan, Karthikeyan Gunasekaran, Ashok Kothari, Gaurav | Thu, Apr 24, 2025 | A follow-up call has been scheduled for next week to assess the feasibility of configuring a block to prevent data ingestion from unintended sources. This initiative aims to enhance data integrity and prevent issues arising from non-prod data flowing into production-aligned systems. | Permanent fix |
| 5 | Any integration testing should be confirmed end to end. Example: if we are triggering data from PLM non-prod, it should be confirmed by downstream system that it has reached the intended system in the desired format. | PTC+/M&S | Thu, Apr 24, 2025 | To be discussed in the follow up call. | Permanent fix |

6	Review and implement controls to prevent non-prod PLM traffic from reaching production systems: 1. API Gateway to enforce rules that only PLM Prod can send data to downstream prod systems 2. Any message originating from non-prod must be automatically rejected	Nayak, Anusha	Thu, Apr 24, 2025	It has been confirmed that both PLM non-prod and production IP ranges are whitelisted at the MNS production endpoint, posing a risk of unintended data flow from non-prod to prod systems. Discussions are in progress to assess the feasibility of implementing stricter controls through the firewall or API gateway.	Permanent fix
7	Identify opportunities to implement automated anomaly detection within CNHDS by introducing verification measures such as: 1. Triggering alerts when PLM sends bulk updates that affect more than a defined threshold (e.g., x%) of records in CNH data domain services, prior to processing. 2. Implementing logic to verify and detect unexpected or abnormal updates within CNHDS before they are committed.	Mandadapu, Naresh	Thu, Apr 24, 2025	Key measures under consideration include setting configurable thresholds to flag large-scale updates from PLM and establishing verification mechanisms to identify and halt unexpected or suspicious data changes.	Permanent fix
8	Explore the feasibility of implementing real-time monitoring and alerting within C&H domain services to detect and raise alerts if PLM non-prod messages—or any unexpected messages— are received in the production environment.	Mandadapu, Naresh	Thu, Apr 24, 2025	Discussions are underway to assess options for setting up real-time monitoring and alerting for CNH domain service production systems.	Problem Identification & Alerting

| 9 | Within CNH domain services, implement versioned data or immutable event logs with replay capabilities to enhance data governance and support effective recovery mechanisms during incidents. | Mandadapu, Naresh | Thu, Apr 24, 2025 | It has been identified that CNH domain services should maintain state or event log history for critical data fields—such as LCP (Landed Cost Price), hierarchy, colorway, etc.—to enable rollback and recovery when issues occur | Problem Identification & Alerting |

Please refer to 📊 Major_ Significant and Key Incident Tracker v1.0.xlsx **for progress updates on Mitigations**

<Mandatory participants: Put it in the meeting invite. >

Technical Details and Useful Documents: