

How-To Guide: EAM Equipment Material Serialization Special considerations while design and manage serial numbers in MDG and Transactional Systems

Applies to

EAM Solutions by Prometheus Group

Summary

This document is about how do one ensure equipment/Material/serial numbers created in transactional system/s are created and mapped for long term usage.

Unique serial numbers and their maintenance can be achieved by below activities.

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Created On: 19-Oct-2021

Version: 2.0

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Introduction

Equipment, material, and serial numbers are used in various industries across Logistics functions. Functionality used to identification of individual instances of Materials and accurate tracking of individual materials / equipment.

MDG EAM Material serialization process implemented to have synchronous equipment data between MDG and transactional systems.

Various Logistics processes Serial numbers can be generated and when serial numbers are generated business can activate equipment manually (T-code IQ01/IQ02) and or using configuration settings in Serialisation profile/Procedures "Serial Number With/Without Equipment Requirement"

Equipment master created during serial number creations (automatic and manual both), there is a need to bring those master data to master data governance because of below two main reasons

- **Data Enrichment:**
Equipment generated in transactional systems do not have complete details to support long term maintenance, hence there is a need to enrich the equipment master data with additional attributes like Maintenance / Planning Plant, manufacturer, Location, Authorization Group, Plant sections, Cost center etc., these are essential details for maintenance of equipment
- **Single source of truth that is MDG system**
Often business struggling to identify various equipment scattered in transactional system, and there by impacting regular / preventive maintenance of equipment, which are installed/stored in warehouse. Hence it is essential to keep MDG system and transaction system in synch.

Applicable product versions

This process is applicable for SAP MDG EAM Prometheus Group solutions Release MDG EAM 1909 and onward product releases

Detailed steps required to ensure equipment/serial numbers are unique across MDG/ Transactional systems

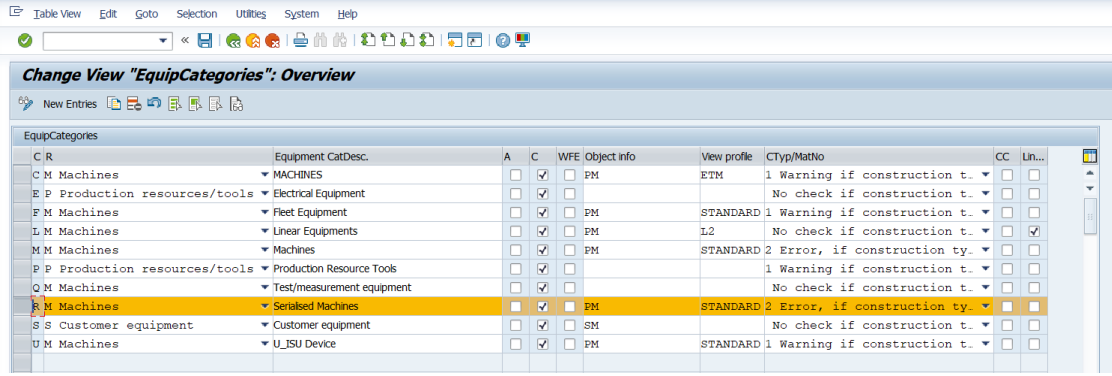
Assumptions

- Business can be able to segregate serialized equipment under separate equipment category which business has to realign the concept of equipment category.
- Like various present category of equipment Machines, test equipment, fleets, PRTs etc, if there is a need to manage serial number for any of other categories, we have to bring that equipment in Special category: Serialized equipment
- Do not allow users to use manual allocation of serial numbers which are reserved for this Category of equipment
- Users are not allowed to use master data t-codes IL01, IL02, IE02, IE4N transactions to change masters, which should always route via MDG.

Pre-requisite configurations

Define equipment category (in Both MDG and Transactional System)

Create a separate Category X: for serialized equipment with menu path: SPRO→ Plant Maintenance and Customer Service→Master Data in Plant Maintenance and Customer Service→Technical Objects→Equipment→Equipment Categories

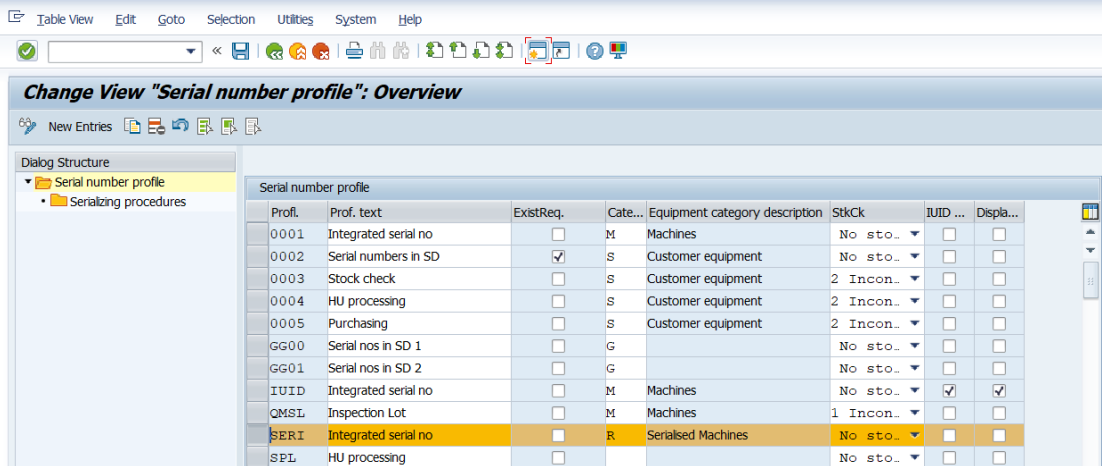


Change View "EquipCategories": Overview

EquipCategories	Equipment CatDesc.	A	C	WFE	Object info	View profile	CTyp/MatNo	CC	Lin...
C R									
C M Machines	▼ MACHINES		<input checked="" type="checkbox"/>		PM	ETM	1 Warning if construction t...		
E P Production resources/tools	▼ Electrical Equipment		<input checked="" type="checkbox"/>				No check if construction t...		
F M Machines	▼ Fleet Equipment		<input checked="" type="checkbox"/>		PM	STANDARD	1 Warning if construction t...		
L M Machines	▼ Linear Equipments		<input checked="" type="checkbox"/>		PM	L2	No check if construction t...		<input checked="" type="checkbox"/>
M M Machines	▼ Machines		<input checked="" type="checkbox"/>		PM	STANDARD	2 Error, if construction ty...		
P P Production resources/tools	▼ Production Resource Tools		<input checked="" type="checkbox"/>				1 Warning if construction t...		
Q M Machines	▼ Test/measurement equipment		<input checked="" type="checkbox"/>				No check if construction t...		
R M Machines	▼ Serialised Machines		<input checked="" type="checkbox"/>		PM	STANDARD	2 Error, if construction ty...		
S S Customer equipment	▼ Customer equipment		<input checked="" type="checkbox"/>		SM		No check if construction t...		
U M Machines	▼ U_ISU Device		<input checked="" type="checkbox"/>		PM	STANDARD	1 Warning if construction t...		

Serialization profile/procedure settings (In both MDG and Transactional Systems)

- Choose equipment category to be used "X-Serialized equipment category"
- Select Equipment: Required: 02: Always propose equipment with your intended serial procedures



Change View "Serial number profile": Overview

Prof.	Prof. text	ExistReq.	Cate...	Equipment category description	StkCk	IUID ...	Displa...
0001	Integrated serial no	<input type="checkbox"/>	M	Machines	No sto...	<input type="checkbox"/>	<input type="checkbox"/>
0002	Serial numbers in SD	<input checked="" type="checkbox"/>	S	Customer equipment	No sto...	<input type="checkbox"/>	<input type="checkbox"/>
0003	Stock check	<input type="checkbox"/>	S	Customer equipment	2 Incon...	<input type="checkbox"/>	<input type="checkbox"/>
0004	HU processing	<input type="checkbox"/>	S	Customer equipment	2 Incon...	<input type="checkbox"/>	<input type="checkbox"/>
0005	Purchasing	<input type="checkbox"/>	S	Customer equipment	2 Incon...	<input type="checkbox"/>	<input type="checkbox"/>
GG00	Serial nos in SD 1	<input type="checkbox"/>	G		No sto...	<input type="checkbox"/>	<input type="checkbox"/>
GG01	Serial nos in SD 2	<input type="checkbox"/>	G		No sto...	<input type="checkbox"/>	<input type="checkbox"/>
IUID	Integrated serial no	<input type="checkbox"/>	M	Machines	No sto...	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
QMSL	Inspection Lot	<input type="checkbox"/>	M	Machines	1 Incon...	<input type="checkbox"/>	<input type="checkbox"/>
SERI	Integrated serial no	<input type="checkbox"/>	R	Serialised Machines	No sto...	<input type="checkbox"/>	<input type="checkbox"/>
SPL	HU processing	<input type="checkbox"/>			No sto...	<input type="checkbox"/>	<input type="checkbox"/>

Maintain Configuration Tables (Tcode : SM30) for Activating Single Change request for Multiple equipment generated at transactional system.

Maintain Table :

/UGI/EQ_MS_CRTYP,

/UGI7/EQ_MS_CRTY

Table View Edit Goto Selection Utilities System Help

Change View "Table for CR type assignment for Material Serialization":

New Entries

CR Proc Type for Serial EQ	Type of Chg. Request	CR Active
Process Multiple Serial Equip. ▾	EQSERMOP	<input checked="" type="checkbox"/>
Process Single Serial Equipm. ▾	EQSERIAL	<input checked="" type="checkbox"/>

Table View Edit Goto Selection Utilities System Help

Display View "Table for CR type assignment for Material Serialization"

CR Proc Ty Serial EQ: Process Multiple Serial EQUI Master(AIW) ▾

Type of Chg. Request: AIWEAMOS

Table for CR type assignment for Material Serialization

☒ CR Serial Active

Possible Setting			Individual Equipment created(via IQ01 example)	Multiple Equipment Created under single Document posting (Via MIGO example)
SOP	MOP	MOCR		
X	X	X	SOP CR will be created	MOCR will be created
X			SOP CR will be created	SOP CR's will be created
	X	X	MOCR will be created	MOCR will be created
	X		MOP CR will be created	MOP CR will be created
		X	MOCR will be created	MOCR will be created
X	X		SOP CR will be created	MOP CR will be created
X		X	SOP CR will be created	MOCR will be created

Additional Features delivered as part of MDG EAM AIW 2021

EAM SOP

- SOP – EAM 9.2
 - This SOP process was supported effective from EAM 9.2
 - We had delivered a new CR TYPE 'EQSERIAL' with single step level approval process
- AS part of EAM 2021
 - This SOP process will continue to function as is
 - Customer can still create Change requests with SOP CR TYPE even though group of equipment's posted under single document and this can be achieved by disabling the MOP/MOCR check boxes (via SM30 - /UGI/EQ_MS_CRTYP, /UGI7/EQ_MS_CRTY) . This option is given to honor the existing functionality as is.
 - In case if there are equipment created individually(for ex via IQ01) and if the SOP check box is active , system always creates SOP CR even though MOP/MOCR is enabled.

- It is allowed to use the custom SOP CR Type also .

EAM MOP :

- This MOP CR process for Material serialization is introduced from EAM 2021 .
- We are delivering a new CR type 'EQSLMASS' with single step level approval process
- Customer should activate the check box (CR Active) for MOP process via (via SM30 - /UGI/EQ_MS_CRTYP) with new CR type EQSLMASS to enable the creation a single MOP CR for group of equipment's for given document.
- Creating MOP Change request is possible eventhough equipment is created individually by just disabling the SOP process (via SM30 /UGI/EQ_MS_CRTYP)
- Customer can change the CR type to either standard delivered MOP CR Type and is it allowed to configure with custom CR type also .

AIW MOCR :

- AS part of AIW 2021
 - This MOCR process for Material serialization is introduced from AIW 2021 .
 - We are reusing existing CR type 'AIWEAM0S' as template as we cannot activate MOCR process in single step approval process as there are multiple entities/approval process is involved.
 - Customer should activate the check box (CR Active) for MOCR process via (via SM30 - /UGI7/EQ_MS_CRTY) with CR type AIWEAM0S to enable the creation a MOCR for group of equipment's for given document.
 - Creating MOCR Change request is possible eventhough equipment is created individually by just disabling the SOP process (via SM30 /UGI/EQ_MS_CRTYP)
 - Customer can change the CR type to either standard delivered Parallel AIW CR/Hybrid AIW CR and it is allowed to configure with custom CR type also .
 - MOCR process is priority over MOP process

Maintain Number ranges for Object Equipment (Tcode OIEN-Edit Intervals equi_nr)

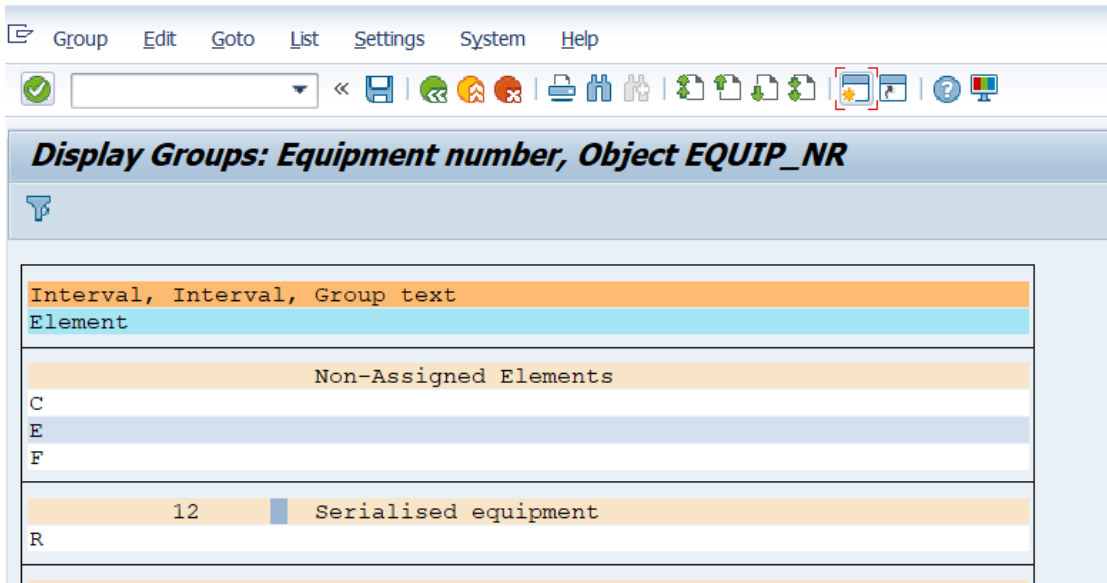
For MDG System

- Maintain separate Number range reserved for serialized equipment and if more than one transactional system, number range should consider all transactional equipment number ranges
- Number range must be set as External number

If you have three transactional system

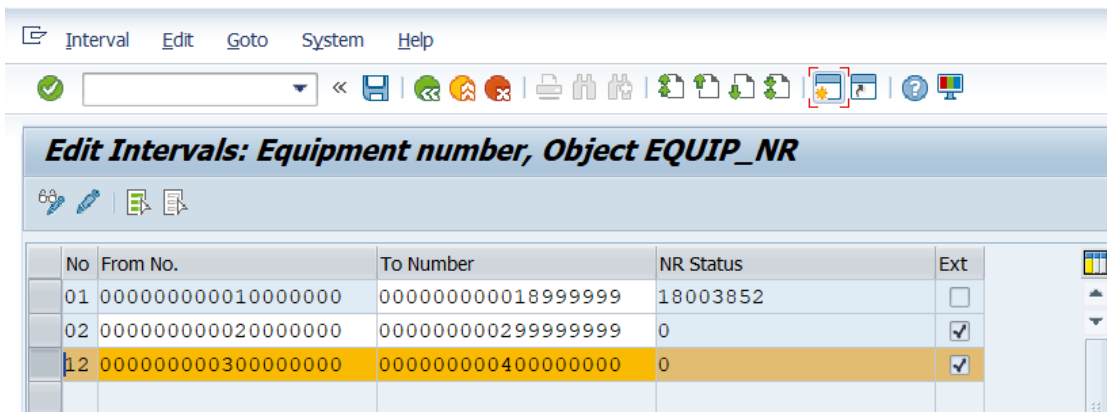
- Transactional System 1 : 10000000- 20000000
- Transactional System 2: 20000000- 30000000
- Then Source equipment category: 10000000-30000000

Example MDG Equipment Number range



Display Groups: Equipment number, Object EQUIP_NR

Interval, Interval, Group text
Element
Non-Assigned Elements
C
E
F
12 Serialised equipment
R



Edit Intervals: Equipment number, Object EQUIP_NR

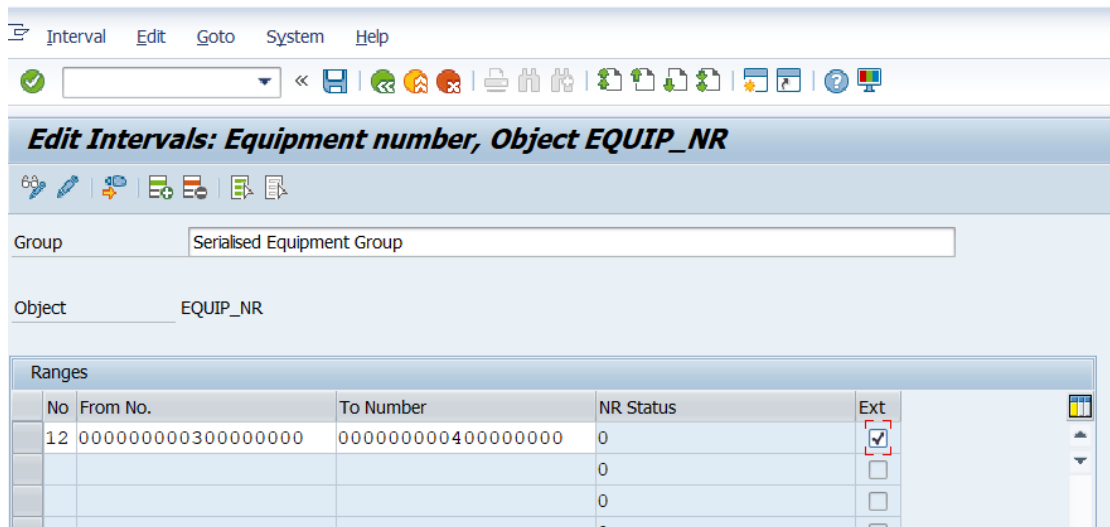
No	From No.	To Number	NR Status	Ext
01	000000000010000000	000000000018999999	18003852	<input type="checkbox"/>
02	000000000020000000	000000000029999999	0	<input checked="" type="checkbox"/>
12	000000000030000000	000000000040000000	0	<input checked="" type="checkbox"/>

Example Transactional system Equipment Number range

For Transactional System

- Overlapping of equipment Object number ranges for the new category across different transactional system should not be used
- Number ranges can be set as internal or external.

Example MDG Equipment Number range



Interval Edit Goto System Help

Edit Intervals: Equipment number, Object EQUIP_NR

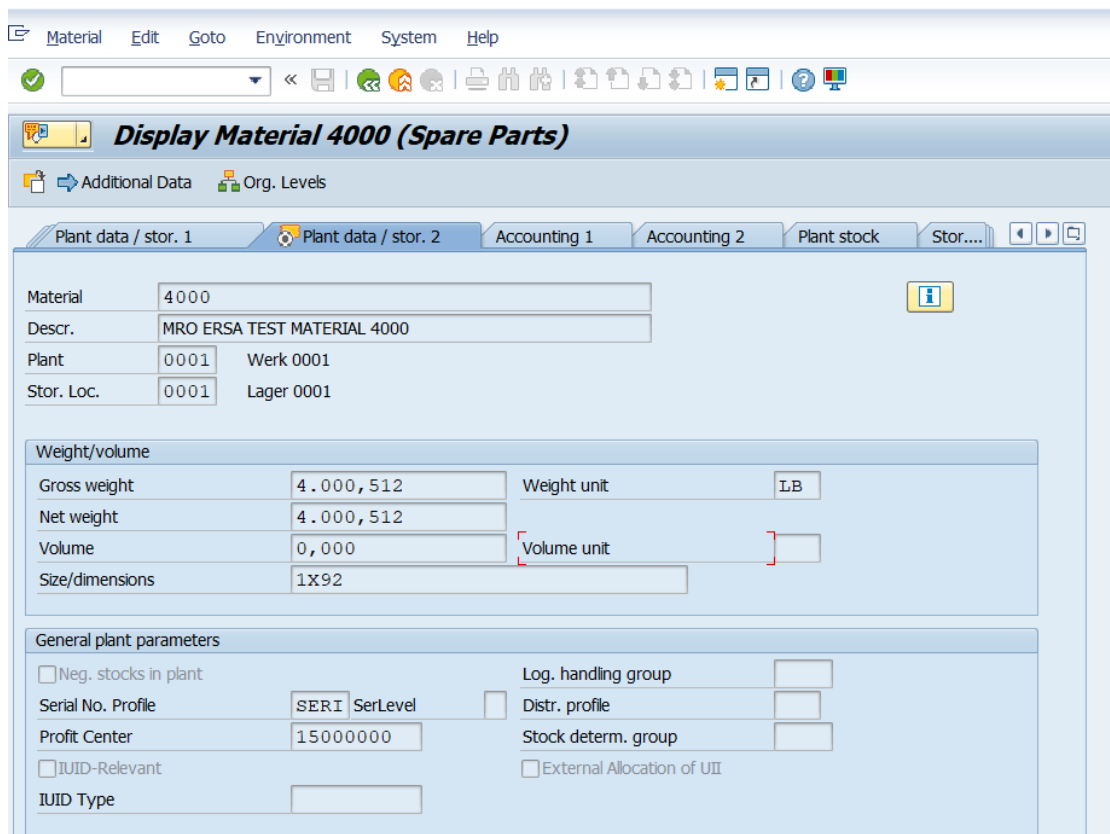
Group: Serialised Equipment Group

Object: EQUIP_NR

No	From No.	To Number	NR Status	Ext
12	000000000300000000	000000000400000000	0	<input checked="" type="checkbox"/>
			0	<input type="checkbox"/>
			0	<input type="checkbox"/>
			0	<input type="checkbox"/>

Master Data Set up

Material Master in MDG system:



Material Edit Goto Environment System Help

Display Material 4000 (Spare Parts)

Additional Data Org. Levels

Plant data / stor. 1 Plant data / stor. 2 Accounting 1 Accounting 2 Plant stock Stor....

Material: 4000

Descr.: MRO ERSA TEST MATERIAL 4000

Plant: 0001 Werk 0001

Stor. Loc.: 0001 Lager 0001

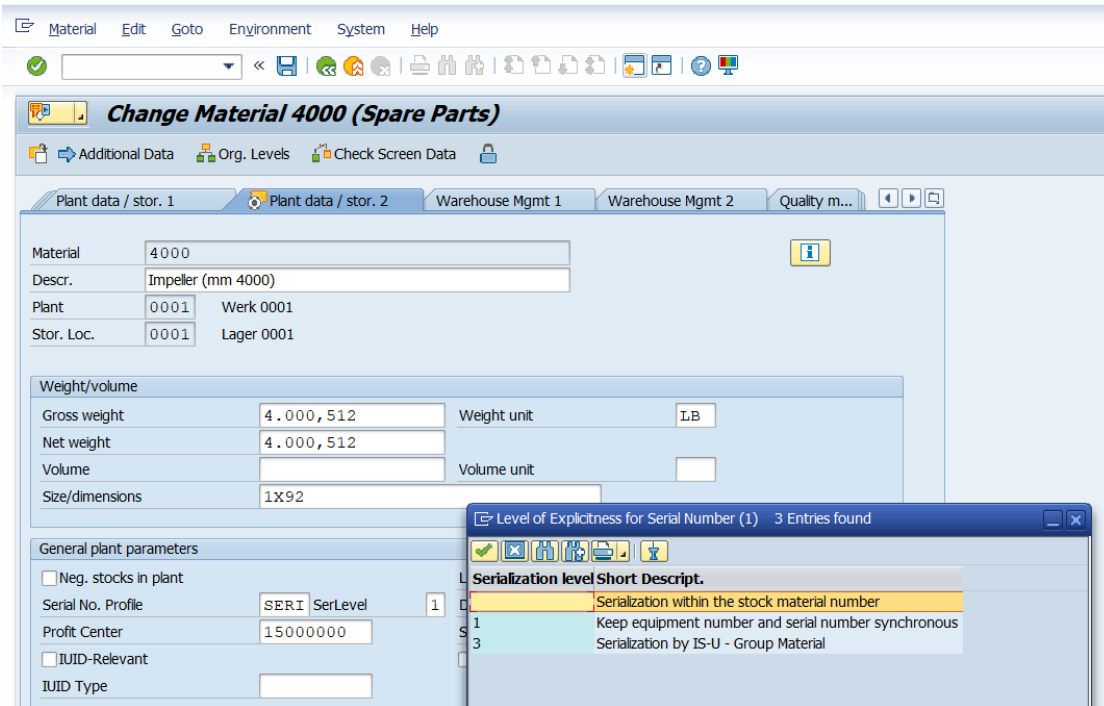
Weight/volume

Gross weight	4.000,512	Weight unit	LB
Net weight	4.000,512		
Volume	0,000	Volume unit	
Size/dimensions	1X92		

General plant parameters

<input type="checkbox"/> Neg. stocks in plant	Serial No. Profile: SERI SerLevel	<input type="checkbox"/> Log. handling group
Profit Center: 15000000		<input type="checkbox"/> Distr. profile
<input type="checkbox"/> IUID-Relevant		<input type="checkbox"/> Stock determ. group
IUID Type:		<input type="checkbox"/> External Allocation of UII

Material Master in Transactional system:



Change Material 4000 (Spare Parts)

Additional Data Org. Levels Check Screen Data

Plant data / stor. 1 Plant data / stor. 2 Warehouse Mgmt 1 Warehouse Mgmt 2 Quality m...

Material: 4000
 Descr.: Impeller (mm 4000)
 Plant: 0001 Werk 0001
 Stor. Loc.: 0001 Lager 0001

Weight/volume
 Gross weight: 4.000,512 Weight unit: LB
 Net weight: 4.000,512
 Volume: Volume unit:
 Size/dimensions: 1X92

General plant parameters
☐ Neg. stocks in plant
 Serial No. Profile: SERI SerLevel: 1
 Profit Center: 15000000
☐ IUID-Relevant
 IUID Type:

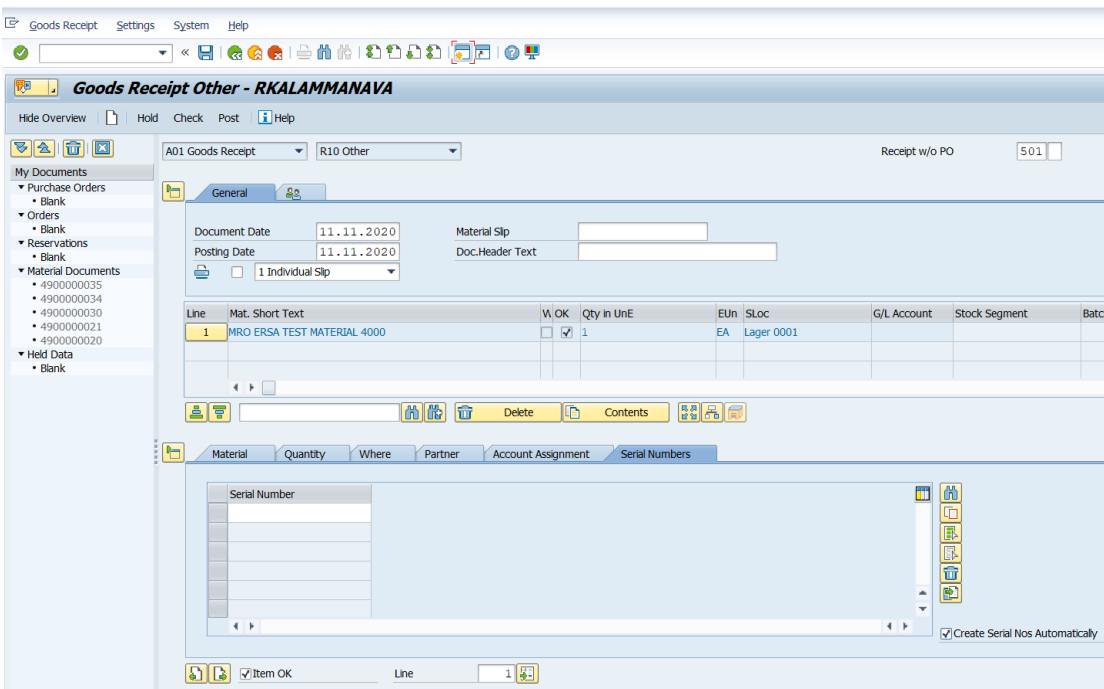
Level of Explicitness for Serial Number (1) 3 Entries found

Level	Short Descript.
0	Serialization within the stock material number
1	Keep equipment number and serial number synchronous
3	Serialization by IS-U - Group Material

Example Process steps for equipment created during Goods receipt

Goods Receipt MIGO

During Goods receipt, System creates numbers which is same as equipment number



Goods Receipt Other - RKALAMMANAVA

Hide Overview Hold Check Post Help

A01 Goods Receipt R10 Other Receipt w/o PO 501

General

Document Date: 11.11.2020 Material Slip:
 Posting Date: 11.11.2020 Doc. Header Text:
☐ 1 Individual Slip

Line	Mat. Short Text	V. OK	Qty in UnE	EUn	Sloc	G/L Account	Stock Segment	Batch
1	MRO ERSA TEST MATERIAL 4000	<input checked="" type="checkbox"/>	1	EA	Lager 0001			

Material Quantity Where Partner Account Assignment Serial Numbers

Serial Number

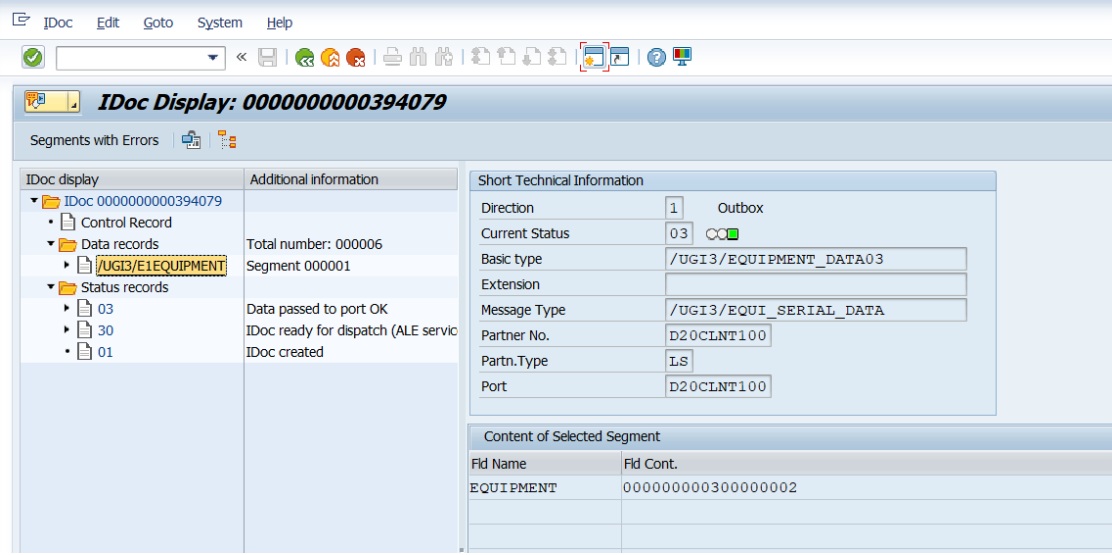
☒ Create Serial Nos Automatically

☒ Item OK Line 1

Generate Outbound Idoc to create Change request in MDG

Run uProgram : /UGI3/CREATE_IDOC_EQUIP_SERIAL to capture equipment details

Outbound Idoc in Transactional system



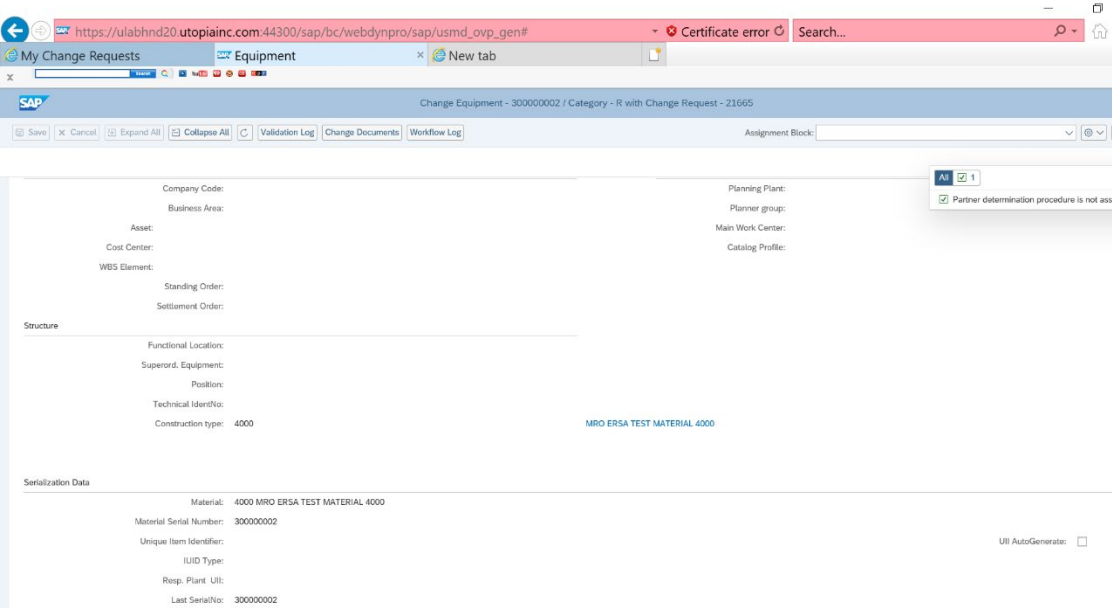
IDoc Display: 0000000000394079

Segments with Errors

IDoc display	Additional information	Short Technical Information
<ul style="list-style-type: none"> IDoc 0000000000394079 <ul style="list-style-type: none"> Control Record Data records <ul style="list-style-type: none"> /UGI3/E1EQUIPMENT Status records <ul style="list-style-type: none"> 03 30 01 	Total number: 000006 Segment 000001 Data passed to port OK IDoc ready for dispatch (ALE service) IDoc created	Direction: 1 Outbox Current Status: 03 Basic type: /UGI3/EQUIPMENT_DATA03 Extension: Message Type: /UGI3/EQUI_SERIAL_DATA Partner No.: D20CLNT100 Partn.Type: LS Port: D20CLNT100

Content of Selected Segment	
Fld Name	Fld Cont.
EQUIPMENT	000000000300000002

Change request processing in MDG (Equipment enrichment)



Change Equipment - 300000002 / Category - R with Change Request - 21665

Assignment Block:

Company Code: Planning Plant:
 Business Area: Planner group:
 Asset: Main Work Center:
 Cost Center: Catalog Profile:
 WBS Element:
 Standing Order:
 Settlement Order:

Structure

Functional Location:
 Superord. Equipment:
 Position:
 Technical IdentNo:
 Construction type: 4000 MRO ERSA TEST MATERIAL 4000

Serialization Data

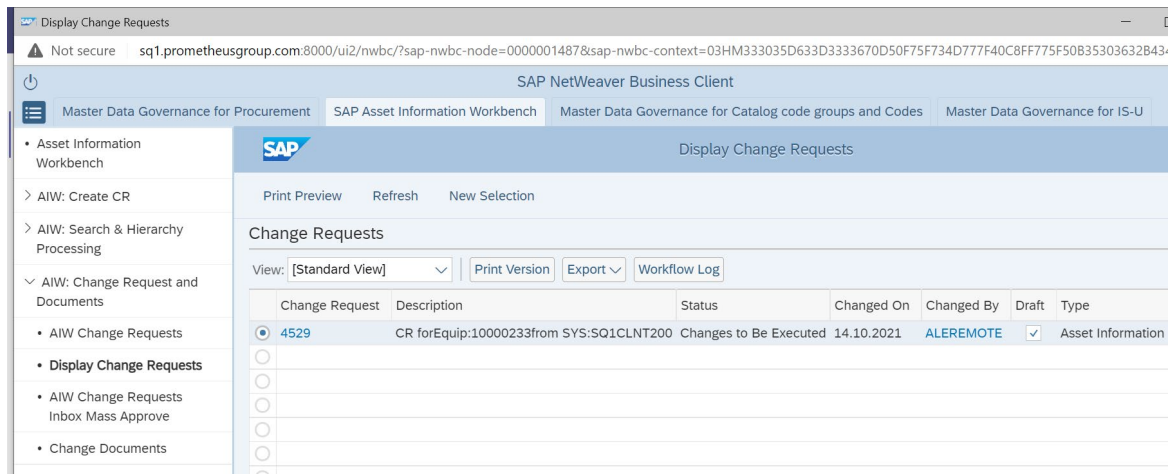
Material: 4000 MRO ERSA TEST MATERIAL 4000
 Material Serial Number: 300000002
 Unique Item Identifier:
 IUID Type:
 Resp. Plant ULI:
 Last SerialNo: 300000002

UII AutoGenerate: ☐

Change request processing in MDG for Multiple equipment (Equipment enrichment)

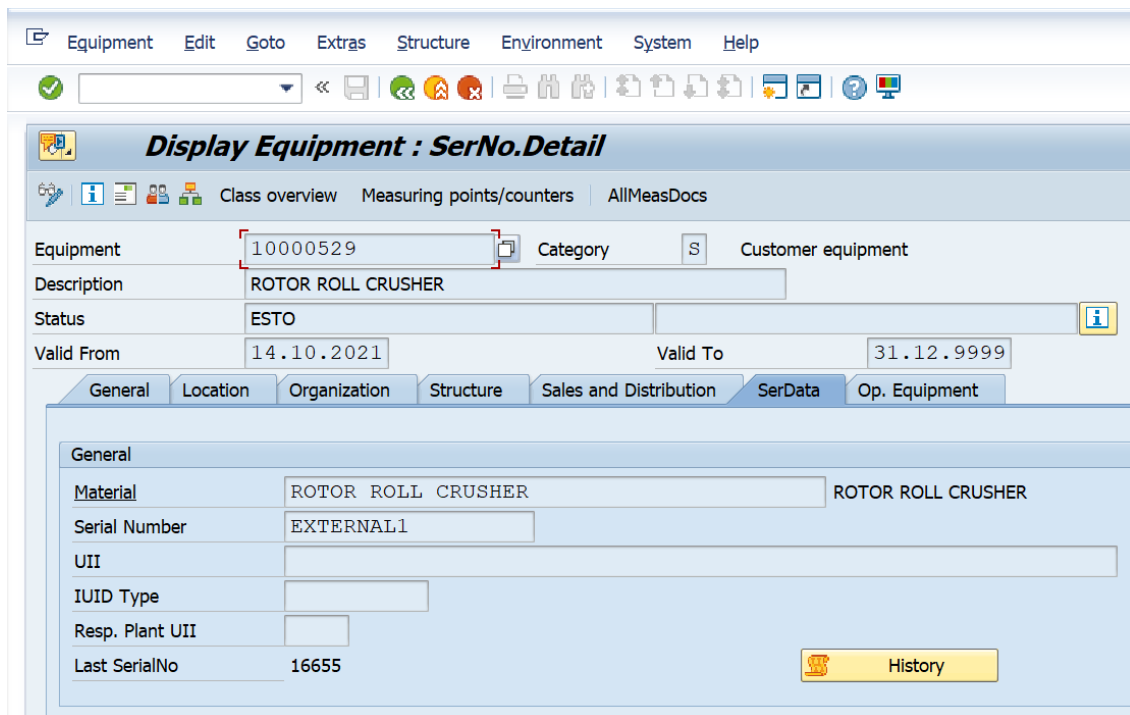
Please note that EAM2021 onwards customer can generate single Change request for Multiple Equipment generated at transactional system.

Refer pre-requisite settings required for enabling these functionalities.



The screenshot shows the SAP NetWeaver Business Client interface for 'Display Change Requests'. The left sidebar contains a navigation menu with options like 'Asset Information Workbench', 'AIW: Create CR', 'AIW: Search & Hierarchy Processing', and 'AIW: Change Request and Documents'. The main area displays a table of change requests. The first row is selected, showing details for change request 4529.

Change Request	Description	Status	Changed On	Changed By	Draft	Type
4529	CR for Equip:10000233from SYS:SQ1CLNT200	Changes to Be Executed	14.10.2021	ALEREMOTE	<input checked="" type="checkbox"/>	Asset Information



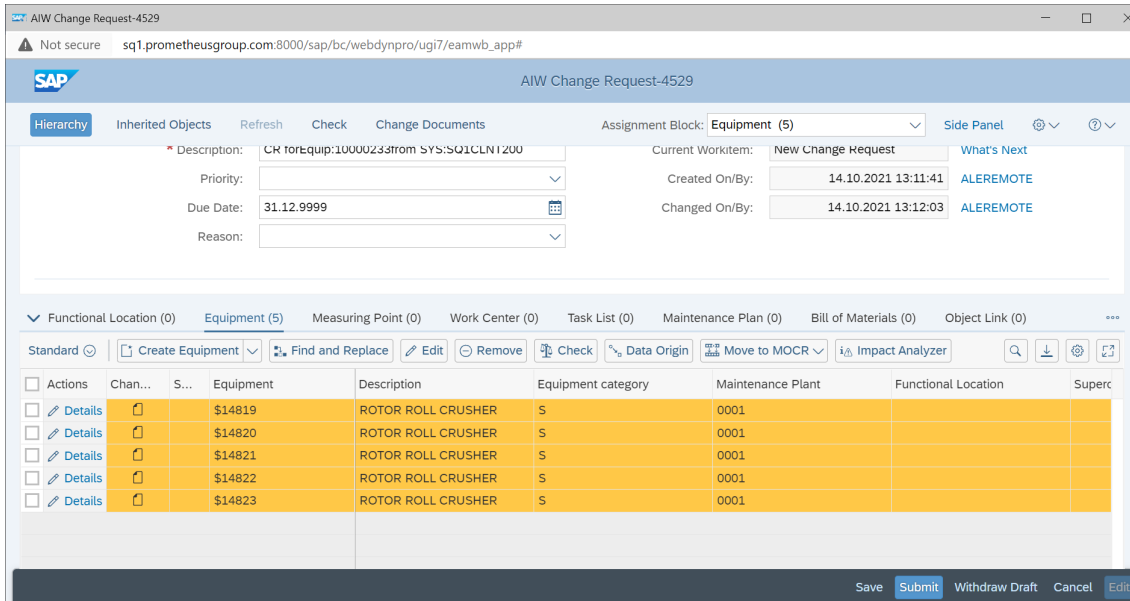
The screenshot shows the 'Display Equipment : SerNo.Detail' screen in the SAP NetWeaver Business Client. The top navigation bar includes 'Equipment', 'Edit', 'Goto', 'Extras', 'Structure', 'Environment', 'System', and 'Help'. The main area displays details for equipment 10000529, including its description 'ROTOR ROLL CRUSHER', status 'ESTO', and valid dates. The 'General' tab is selected, showing fields for Material, Serial Number, UII, IUID Type, Resp. Plant UII, and Last SerialNo.

Equipment Details:

- Equipment: 10000529
- Description: ROTOR ROLL CRUSHER
- Status: ESTO
- Valid From: 14.10.2021
- Valid To: 31.12.9999

General Tab Fields:

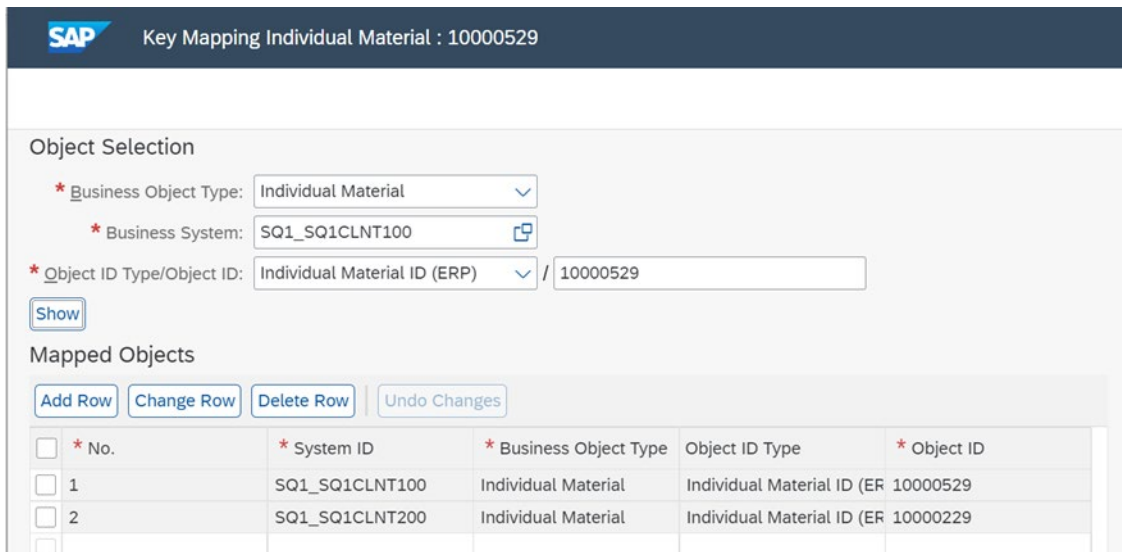
- Material: ROTOR ROLL CRUSHER
- Serial Number: EXTERNAL1
- UII:
- IUID Type:
- Resp. Plant UII:
- Last SerialNo: 16655



The screenshot shows the SAP AIW Change Request-4529 interface. The top bar displays the title 'AIW Change Request-4529' and the URL 'sq1.prometheusgroup.com:8000/sap/bc/webdynpro/ugi7/eamwb_app#'. The main area is divided into several sections. On the left, there are tabs for 'Hierarchy', 'Inherited Objects', 'Refresh', 'Check', and 'Change Documents'. The 'Hierarchy' tab is active, showing a tree structure with 'Equipment (5)' selected. The right side of the interface contains a form for the change request details, including fields for 'Description', 'Priority', 'Due Date', 'Reason', 'Current Workitem', 'Created On/By', and 'Changed On/By'. Below the form, there is a table with columns for 'Actions', 'Chan...', 'S...', 'Equipment', 'Description', 'Equipment category', 'Maintenance Plant', 'Functional Location', and 'Superc'. The table contains five rows of data, all with 'Equipment' as the category and '0001' as the maintenance plant. At the bottom of the interface, there are buttons for 'Save', 'Submit', 'Withdraw Draft', 'Cancel', and 'Edit'.

Key mapping

System establishes key mapping automatically for the equipment from transactional system and MDG created equipment



The screenshot shows the SAP Key Mapping Individual Material : 10000529 interface. The top bar displays the title 'Key Mapping Individual Material : 10000529'. The main area is divided into two sections: 'Object Selection' and 'Mapped Objects'. The 'Object Selection' section contains fields for 'Business Object Type' (Individual Material), 'Business System' (SQ1_SQ1CLNT100), and 'Object ID Type/Object ID' (Individual Material ID (ERP) / 10000529). Below these fields is a 'Show' button. The 'Mapped Objects' section contains buttons for 'Add Row', 'Change Row', 'Delete Row', and 'Undo Changes'. Below these buttons is a table with columns for 'No.', 'System ID', 'Business Object Type', 'Object ID Type', and 'Object ID'. The table contains two rows of data, both with 'Individual Material' as the business object type and 'Individual Material ID (ERP)' as the object ID type.

No.	System ID	Business Object Type	Object ID Type	Object ID
1	SQ1_SQ1CLNT100	Individual Material	Individual Material ID (ERP)	10000529
2	SQ1_SQ1CLNT200	Individual Material	Individual Material ID (ERP)	10000229

Replication back to Transactional after enrichment

After approval of change request, enriched equipment will replicate back to transactional system which is normal MDG replication process.