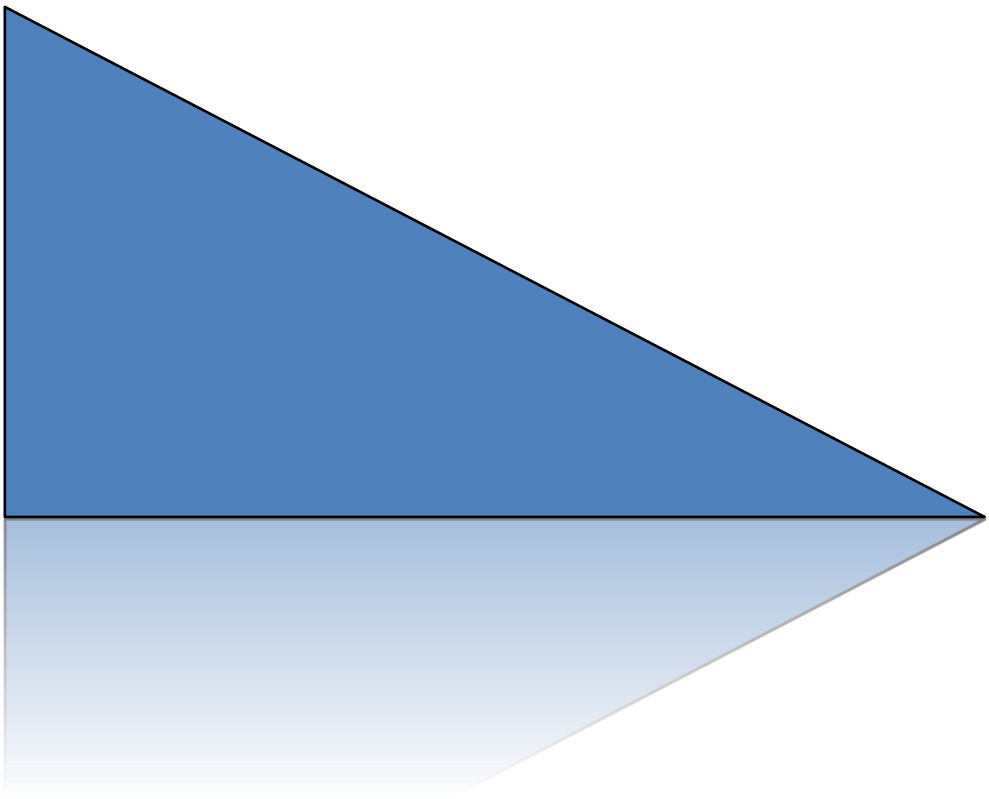
Amkor AMHS 사양서
Stocker



Version 2.3.3

Amkor Technology®

Contents

1. AMHS 설비 사양 개요
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6. Scenario

Rev. History

Date	Version	변경내역
2016/02/10	1.0	최초 작성
2018/02/19	2.0.0	Batch Transfer 관련 추가
		Active Alarm 정보 변경
		Unit Alarm 정보 추가
2018/03/06	2.0.1	Port Access Mode 추가(CEID, VID)
		S1F3/S1F4 Access Mode 추가
		S6F11 Access Mode Event 추가
2018/04/02	2.0.2	S2F49 CPNAME 'LOTID' → 'BATCHID' 로 변경
2018/08/28	2.1	Material Change Info Event 추가
2018/08/28	2.1	Sorter Type Stocker 반송 Scenario 추가
2022/09/05	2.2	1. Reticle Stocker Logic 추가 A. Carrier Stored B. Carrier Wait out C. Reticle Abnormal Scenario D. EmptyCarrierCount 2. Batch Transfer 제거 3. Wafer Stocker scenario 제거
2022/09/20	2.3	1. RETICLE STOCKER WAIT_IN 추가(CEID 2110)
2022/12/14	2.3.1	S3F101 LOT_INFO Item 추가(CustName)
2022/12/26	2.3.2	• AlarmSet / Clear 삭제(1301 / 1302) • AccessMode 삭제, CEID 5103 삭제 • Reticle Stocker 시나리오 1. Duplicate 수정
2023/01/31	2.3.3	미사용 메시지 및 VID 제거 Host Command Timeout 시 자재 Shelf Stored 처리 (기존 Error Port 배출) All Port Info(VID7) -> All Unit Info(VID 7) 명칭 변경

PART 01 AMHS 설비 사양개요

1. 전제조건
2. AMHS Controller 사양
3. 공통 State 모델
4. 용어정의
5. 반도체 표준 사양

A. 요구 사항

- 앰코 반도체 무인 물류 자동화를 위하여 AMHS 설비 업체에 요구되어 지는 모든 기능이 구현 되어져야 한다
- Hold zone, Duplicate or Unknown 등 비정상 자재에 대해 화면에 표시가 가능해야 한다.

B. 전제 조건

- 본 사양은 앰코 Host 시스템과 AMHS 설비와의 통신을 위하여 반도체 통신 규약인 SECS 및 HSMS 를 기본으로 한다
- AHMS 설비와 Host 간의 모든 Interface 는 AMHS 설비 입고 전 모두 자체 테스트 되어 져야 하며 앰코 반도체의 검수를 받아야 한다
- 앰코 반도체내 설비 셋업 시 AMHS 설비의 FA 엔지니어는 반드시 상주하여 최종 검수 확인 때 까지 지원하여야 한다
- AMHS 설비 메이커는 CIM 관련 운영 매뉴얼 및 사용자 매뉴얼 문서를 제출 하여야 한다 (한글 2본)
- 특이 사항 또는 기능의 추가/삭제에 대하여 앰코 반도체 엔지니어와의 협의를 통하여 이루어 져야 한다
-

A. H/W 요구 사항

- CPU 사용량 : 항상 60% 미만 유지
- Memory 사용량 : 항상 60% 미만 유지
- HDD 사용량 : 항상 10GB 여유 공간 유지 - Log 등은 주기적으로 Backup
- Backup System : Main H/W 문제 발생시 특정 시간 (ex 10분) 내 조치 가능하도록 준비

B. S/W 요구 사항

- OS : 벤더 선택 사항

  Windows 의 경우 Windows 10 Pro 또는

  Windows Server 2016 이상
- 바이러스 백신 : Amkor 에서 제공

C. Host 통신 방법

- SEMI Standard E5, E30, E37, E88 구현
- HSMS 통신방식 채택(Not SECS-I)

A. 통신 상태 모델 (Control State)

1. OFFLINE

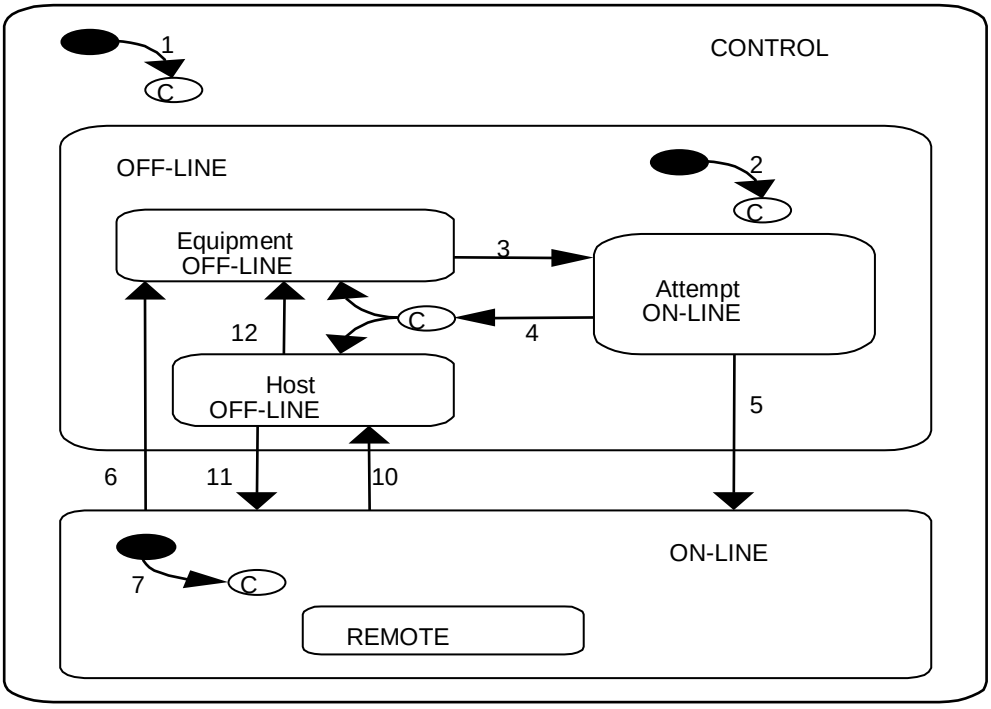
- EVENT 송수신 불가.

2. ONLINE LOCAL

- EVENT 수신만 가능.
- 반송은 MCP 에서 수행.

3. ONLINE REMOTE

- EVENT 송수신 가능.
- MCS에서 반송지시 가능



B.Controller 상태 모델

1. INIT

반송 명령 받지 않음.

2. PAUSED

반송 명령은 받지만 QUEUE에
저장만하고 수행은 하지 않음.

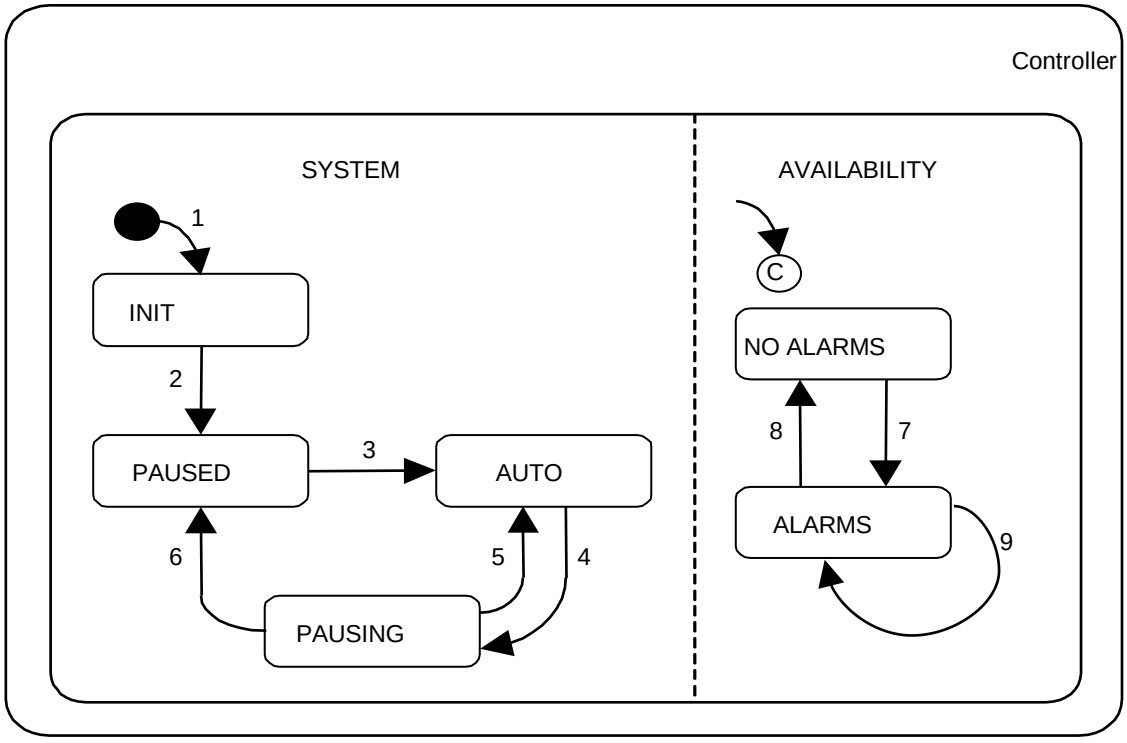
3. PAUSING

현재 진행중인 CARRIER만 반송을 진행함.

반송 명령은 받지만 QUEUE에 저장만하고 수행은 하지 않음.

4. AUTO

모든 반송명령 수행



- **MCS (Material Control System)**
  - 물류 반송 장치를 제어하고 관리하는 물류 반송 시스템

- **AMHS (Automated Material Handling System)**
  - 공장 내 물류의 저장(Storage)과 반송(Transport)을 위한 물류 반송 장치

- **GEM (Generic Equipment Model)**
  - SEMI에서 규정한 일반적인 반도체 생산 장비 운영을 위한 사양서

- **Stocker-SEM (Specification for AMHS Storage Specific Equipment Model)**
  - SEMI에서 규정한 Stocker 운영을 위한 사양서

- **IB-SEM (Specification for Interbay / Intrabay AMHS SEM)**
  - SEMI에서 규정한 AGV, OHS등의 반송 장비 운영을 위한 사양서

- **SC (Stocker Controller)**
  - Stocker내의 데이터를 관리하고 Device 를 제어하는 Controller

- **TSC (Transport System Controller)**
  - 반송 장비를 제어하는 Controller. 대표적으로 AGV Controller 가 있음

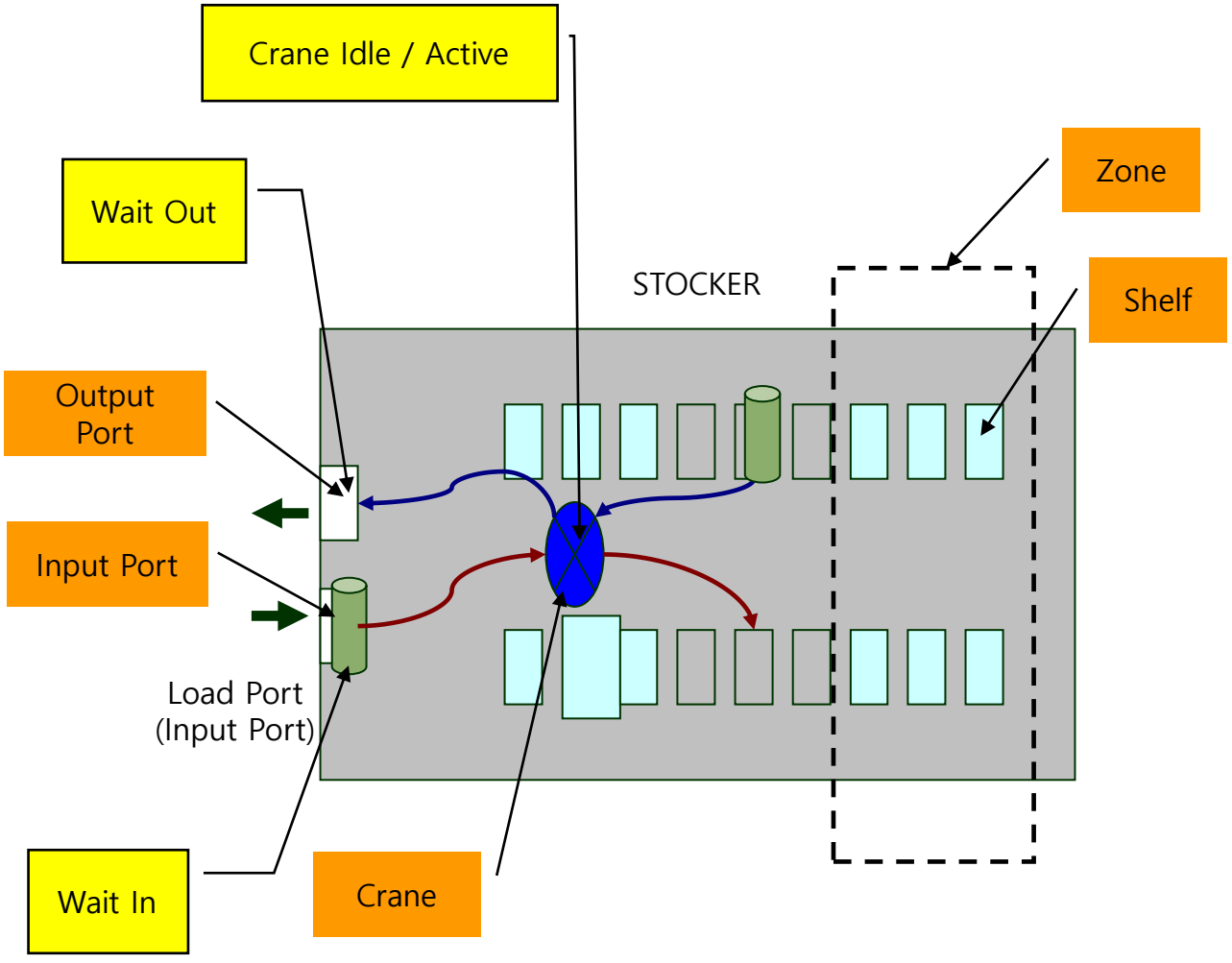
- **AGV (Automated Guided Vehicle)**
  - Guide Line을 타고 자동으로 해당 목적지에 물류를 반송하는 장비(Vehicle)
- **OHS (Overhead Shuttle)**
  - Shuttle이 천정에 장착된 레일을 따라 자동으로 물류를 반송하는 장치
- **Lift**
  - 서로 다른 층간의 반송에 쓰이는 반송 장비
- **RGV (Rail Guided Vehicle)**
  - Rail을 따라 움직이는 반송 장비
- **LP (Load Port)**
  - 생산 프로세스나 저장(Stocker Input)을 위하여 올려 놓는 포트
- **OP (Output Port)**
  - 외부 반송을 위하여 출고하는 포트
- **BP (Buffer Port)**
  - 특수한 목적을 위하여 물류를 임시로 저장하는 Port
- **Unit**
  - **Crane**
  - **Shelf**
- **Port**
  - **LP,BP,OP**

- **SEMI E5 (SECS-II)**
  - SEMI Equipment Communication Standard 2 Message Transfer
- **SEMI E30 (GEM)**
  - Generic Model for Communication and Control of SEMI Equipment
  - Partially implements
- **SEMI E37 (HSMS)**
  - High-Speed SECS Message Services
- **SEMI E82 (IB-SEM)**
  - Specification for InterBay / IntraBay AMHS SEM
- **SEMI E84 (PIO)**
  - Specification for Enhanced Carrier Handoff Parallel I/O Interface
- **SEMI E88 (Stocker-SEM)**
  - Specification for AMHS Storage SEM

PART 02 STOCKER 제어 사양

1. Stocker 사양 개요
2. 반송 명령 상태 모델
3. Carrier 상태 모델
4. Crane 상태 모델

2.1 Stocker 사양 개요



1. **Queued**

   반송 명령이 Queue에 쌓여있는 상태

2. **Active**

   반송명령이 실행된 상태

3. **Transferring**

   Active의 하위 상태로 실행되고 있는 반송 명령 상태

4. **Paused**

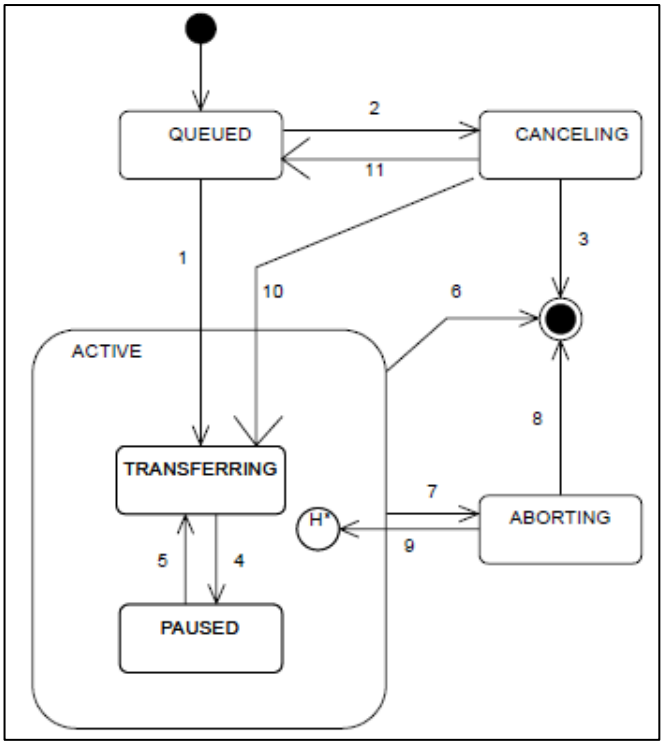
   Active의 하위 상태로 장비의 Error등으로 인해 중지되어 있는 명령 상태

5. **Canceling**

   취소되어지는 반송명령 상태

6. **Aborting**

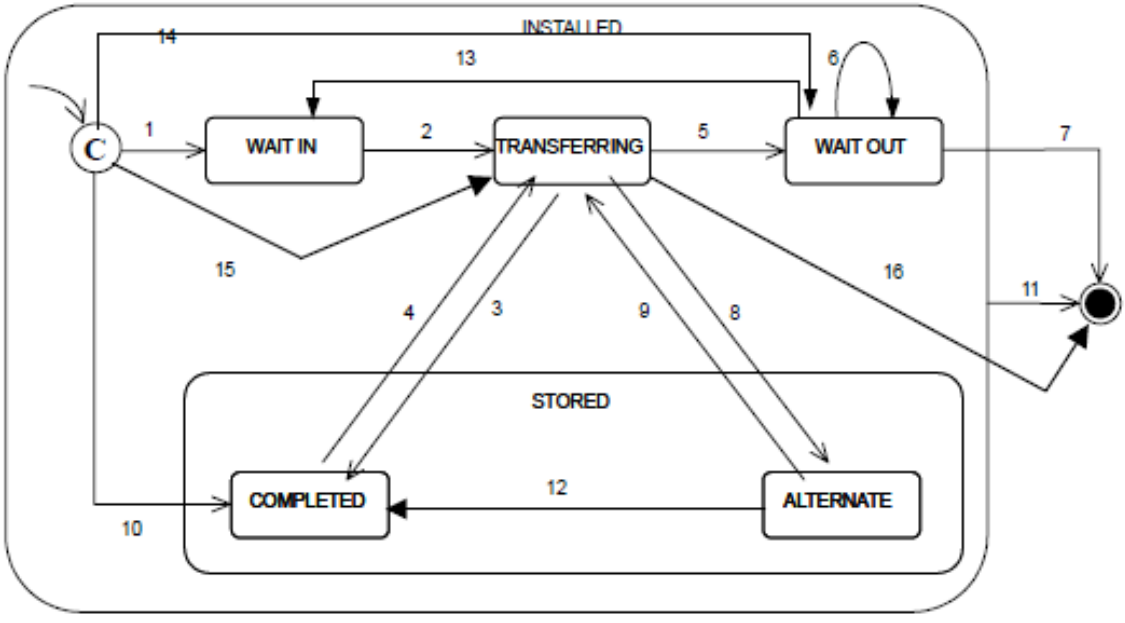
   특정 사유로 중지되어지는 명령 상태



B. 상태 모델 Table

No	Previous State	Trigger	New State	Action	Comments
1	Queued	Transfer Command가 SC에 초기화되고 있음	Transferring	Transfer Initiated	
2	Queued	Host가 특정한 Command에 대해 Cancel명령을 내림	Canceling	Transfer Cancel Initiated	
3	Canceling	Cancel명령이 완료됨.	None	Transfer Cancel Completed	
4	Transferring	비정상적인 상태에서 반송명령 Pause 실행	Paused	Transfer Paused for a specific Command ID	
5	Paused	비정상적인 상태가 해소됨에 따라 반송명령 Resume 실행	Transferring	Transfer Resumed for A specific Command ID	
6	Active	반송명령이 성공적(또는 실패)으로 완결됨	None	Transfer Completed (성공 '0' 또는 Error Code)	
7	Active	Host가 비정상적인 특정한 반송명령에 대해 Abort시킴	Aborting	Transfer Abort Initiated	
8	Aborting	Abort명령이 SC에 의해 수행 완료	None	Transfer Abort Completed	
9	Aborting	반송명령 Abort 불가	Active	Transfer Abort Failed	
10	Canceling	Active 상태로 반송 명령 취소불가	Transferring	Transfer Initiated	
11	Canceling	반송 명령 취소불가며 대기 상태	Queued	Transfer Cancel Failed	

A. 상태 모델 Diagram

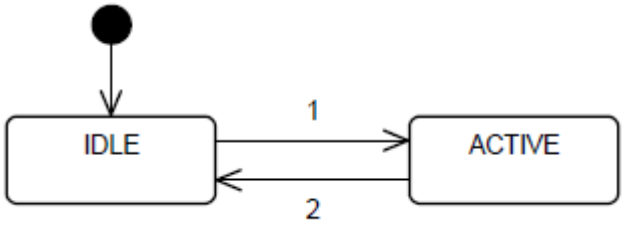


Installed- Stocker Database에 Carrier가 등록이 된 상태
Wait In- Installed의 하위상태로 Carrier가 입고되기를 기다리는 상태
Wait Out- Installed의 하위상태로 Carrier가 출고되기를 기다리는 상태
Transferring- Installed의 하위상태로 Carrier가 반송중인 상태
Stored- Installed의 하위상태로 Carrier가 입고 완료된 상태
Completed- Stored의 하위상태로 정상 입고된 상태
Alternate - Stored의 하위상태로 임시로 입고된 상태

B. 상태 모델 Table

No	Previous State	Trigger	New State	Action	Comments
1	None	Carrier가 Stocker에 등록됨	Wait In	Carrier Wait In	
2	Wait In	Carrier에 대해 반송명령수행	Transferring	Carrier Transferring	
3	Transferring	Stocker 내부 Destination에 반송 명령 수행 완료	Completed	Carrier Stored	
4	Completed	Carrier에 관한 반송명령수행	Transferring	Carrier Transferring	
5	Transferring	반송 명령 완료지점 Port에 Carrier가 도착	Wait Out	Carrier WaitOut	
6	Wait Out	Carrier가 Output Port에 놓여짐	Wait Out	Carrier WaitOut	
7	Wait Out	Output Port에서 Carrier가 빠져나감	None	Carrier Removed	
8	Transferring	Carrier가 임시로 저장됨	Alternate	Carrier Stored Alt	
9	Alternate	목적지 이동이 가능함에 따라 Carrier 반송을 수행	Transferring	Carrier Resumed	
10	None	Carrier 입고 정보가 SC DB 에서 만들어지거나 수정됨	Completed	Carrier Install Completed	
11	Installed	Carrier 입고 정보가 SC DB 에서 지워짐.	None	Carrier Removed Completed	

A. 상태 모델 Diagram



Idle - Stocker Crane이 일을 수행하지 않고 있는 상태
Active - Stocker Crane이 반송 명령을 수행하여 움직이는 상태

B. 상태 모델 Table

No	Previous State	Trigger	New State	Action	Comments
1	Idle	SC나 host에서의 요구를 수행	Active	Crane Active	
2	Active	SC나 host에서의 요구 수행 완료	Idle	Crane Idle	

PART 03 ID Rule

1. CommandID
2. CarrierID
3. 장치정보

Command Id 구성

(U/H/M/N/E) + Carrier ID + Time(yyyyMMddHHmmssfff)

시스템	Prefix	예제
MES, MCS server	H	HCARRIER01201609040939311123
MCS UI	U	UCARRIER01201609040939311123
Stocker	C	CCARRIER01201609040939311123

Case		예제
ID read fail		UNK_+CurrLoc(port id)+DateTime(yyyyMMddHHmmssfff)
		UNK_STK01_IP01201609080939311 23
Duplicate		DUP_+CarrierID+DateTime(yyyyMMddHHmmssfff)
		DUP_CST001201609080939311 23
Double Store		DBS_+UnitID+DateTime(yyyyMMddHHmmssfff)
		DBS_STK-K41-SM-01_120082018062216595523
* Reticle	Read Fail	RET_UNK_DateTime(yyyyMMddHHmmssfff) Ex)RET_UNK_20220905040105
	DUP	RET_DUP_CARRIERID_DateTime(yyyyMMddHHmmssfff) Ex)RET_DUP_TEST001_20220905040105
	DBS	RET_DBS_UnitID_DateTime(yyyyMMddHHmmssfff) Ex)RET_DBS_STK-K52-BM-01_12003_20220905040105

Case	예제
STOCKERID	STK-K52-BM-01 ~ STK-K52-BM-06 STK-K52-FC-01 ~ STK-K52-FC-04
UNITID	AUTO => I : STK-K52-BM-01_LP01 O : STK-K52-BM-01_OP01 MANUAL => I : STK-K52-BM-01_LP06 O : STK-K52-BM-01_OP06
SHELFID	STK-K52-BM-01_10101~ STK-K52-BM-01_2xxyy (10101 : zxxyy / BankBayLavel) – 5 Digit
CRANEID	{STOCKERID}_RM01

PART 04 SECS Message

1. Stream 1
2. Stream 2
3. Stream 5
4. Stream 6
5. Stream 9
6. Stream 10

4.1 Stream 1 (state)

Messages	Direction	Description	Note
SxF0	**H<->E**	Abort Transaction	
S1F1	**H<->E**	Are You There Request (R)	
S1F2	**H<->E**	On-line Data (D)	
S1F3	**H -> E**	Selected Equipment Status Request (SSR)	
S1F4	**H <- E**	Selected Equipment Status Data (SSD)	
S1F13	**H<->E**	Establish Communication Request (CR)	
S1F14	**H<->E**	Establish Communication Request Ack. (CRA)	
S1F15	**H -> E**	Request OFF-LINE(ROFL)	
S1F16	**H <- E**	OFF-LINE Ack. (OFLA)	
S1F17	**H -> E**	Request ON-LINE(RONL)	
S1F18	**H <- E**	ON-LINE Ack. (ONLA)	

4.2 Stream 2 (control)

Messages	Direction	Description	Note
~~S2F13~~	~~H -> E~~	~~Equipment Constant Request (ECR)~~	
~~S2F14~~	~~H <- E~~	~~Equipment Constant Data (ECD)~~	
~~S2F29~~	~~H -> E~~	~~Equipment Constant Name List Request~~	
~~S2F30~~	~~H <- E~~	~~Ack. to Eqp Constant Name List Request~~	
S2F31	**H -> E**	Date and Time Set Request (DTS)	
S2F32	**H <- E**	Date and Time Set Ack. (DTA)	
~~**S2F37**~~	~~**H -> E**~~	~~**Enable/Disable Event Report (EDER)**~~	
~~**S2F38**~~	~~**H <- E**~~	~~**Enable/Disable Event Report Ack. (EERA)**~~	
S2F41	**H -> E**	Host Command Send (HCS)	
S2F42	**H <- E**	Host Command Ack. (HCA)	
S2F49	**H -> E**	Enhanced Remote Command	
S2F50	**H <- E**	Enhanced Remote Command Ack.	

4.3 Stream 5 (alarm)

Messages	Direction	Description	Note
S5F1	**H <- E**	Alarm Report send (ARS)	
S5F2	**H -> E**	Alarm Report Acknowledge (ARA)	
S5F3	**H -> E**	Enable, disable alarm request	
S5F4	**H <- E**	Enable, disable alarm reply	
S5F5	**H -> E**	Alarm List Request	
S5F6	**H <- E**	Alarm List Request Acknowledge	

4.4 Stream 6 (event)

Messages	Direction	Description	Note
S6F11	**H <- E**	Event Report Send(ERS)	
S6F12	**H -> E**	Event Report Acknowledge(ERA)	

4.5 Stream 9 (error)

Messages	Direction	Description	Note
S9F1	**H <- E**	Unrecognized Device ID	
S9F3	**H <- E**	Unrecognized Stream Type	
S9F5	**H <- E**	Unrecognized Function Type	
S9F7	**H <- E**	Illegal Data	
S9F9	**H <- E**	Transaction Timer Timeout	

4.6 Stream 10 (terminal message display)

Messages	Direction	Description	Note
S10F3	**H -> E**	Terminal Display	
S10F4	**H <- E**	Terminal Display Ack.	

PART 05 SECS Message Detail

1. CEID
2. VID
3. Remote Command
4. Stream Function

5.1 CEID: Control state

5.1.1 Control State Event

CEID	STATE	STATE	
		OLD	NEW
1101	OFFLINE	LOCAL,REMOTE	OFFLINE
1102	LOCAL	OFFLINE,REMOTE	LOCAL
1103	REMOTE	OFFLINE,LOCAL	REMOTE

5.1.2 SC State Transition Event

CEID	Name	STATE	
		OLD	NEW
1201	SC Auto Initiated	NONE	SC INIT
1202	SC Auto Completed	PAUSED	AUTO
		PASUING	
1203	SC Pause Initiated	AUTO	PAUSING
1204	SC Pause Completed	PAUSING	PAUSED
1205	SC Paused	SC INIT	PAUSED
1301			
1302			
1303	Unit Alarm Set	NO ALARM	ALARM
1304	Unit Alarm Clear	ALARM	NO ALARM

5.1.3 Carrier State Transition Event

CEID	Name	STATE	
		OLD	NEW
2101	ID read		
2102	Carrier wait in	NONE	WAITIN
2103	Carrier transferring	WAITIN	TRANSFERRING
2104	Carrier stored	TRANSFERRING	COMPLETE
2105	Carrier stored alt	TRANSFERRING	ALTERNATE
2106	Carrier wait out	TRANSFERRING	WAITOUT
2107	Carrier removed	WAITOUT	NONE
* 2108	Carrier stored(used reticle stocker)	TRANSFERRING	COMPLETE
* 2109	Carrier wait out(used reticle stocker)	TRANSFERRING	WAITOUT
* 2110	Carrier Wait In(used reticle stocker)	NONE	WAITIN
2201	Carrier install comp.	NONE	INSTALL
2202	Carrier remove comp.	INSTALL	NONE
2203	Carrier locate comp.		
• 2204	Carrier install comp.(used reticle stocker)	NONE	INSTALL

5.1.4 Transfer Command Transaction Event

CEID	Name	STATE	
		OLD	NEW
3101	Transfer Initiated	QUEUED	TRANSFERRING
3102	Transfer Completed	ACTIVE	NONE
3103	Transfer Paused	TRANSFERRING	PAUSED
3104	Transfer Resumed	PAUSED	TRANSFERRING
3201	Transfer Abort Initiated	ACTIVE	ABORTING
3202	Transfer Abort Completed	ABORTING	NONE
3203	Transfer Abort Failed	ABORTING	ACTIVE
3301	Transfer Cancel Initiated	QUEUED	CANCELLING
3302	Transfer Cancel Completed	CANCELLING	NONE
3303	Transfer Cancel Failed	CANCELLING	QUEUED

5.1.5 Crane Status Transition Event

CEID	Name	STATE	
		OLD	NEW
4101	Crane active	IDLE or ALARM	ACTIVE
4102	Crane idle	ACTIVE or ALARM	IDLE
~~4103~~	~~Crane moving~~		
Crane PM 주기 설정 체크 위해 가동률 계산			

5.1.6 Zone Status Transition Event

CEID	Name	STATE	
		OLD	NEW
4201	Zone capacity change		

5.1 CEID: Operator Init action

5.1.7 Operator Event

CEID	Name	STATE	
		OLD	NEW
4301	Operator Init action		

5.1.8 State Event

CEID	Name	STATE	
		OLD	NEW
5101	Unit State Changed (Inservice, OutofService)	NONE	NONE
5102	Unit Status Changed (Empty/Busy)	NONE	NONE

5.1.9 Empty Carrier Event

CEID	Name	STATE	
		OLD	NEW
6101	Empty Carrier Info		

5.2 VID

5.2.1 Basic

VID	Name	Class	Format	Details
1	SC Name	SV/DV	A,64	SC ID Eqp Name
2	Control State	SV/DV	U2,1	1: Eqp Offline 2: Attempt Online 3: Host Offline 4: Online Local 5: Online Remote
3	SC State	SV/DV	U2,1	1=SC Init 2=Paused 3=Auto 4=Pausing
4	Active Carriers	SV	L,n 1. <CarrierInfo1> ... n. <CarrierInfon>	
5	Active Transfers	SV	L,n 1. <TransferCommand1> ... n. <TransferCommandn>	
6	Active Zones	SV	L,n 1. <ZoneData1> ... n. <ZoneDatan>	
7	All Unit Infos	SV	L,n 1. <Unit Info> ... n. <Unit Info>	VID 16
8	All Shelf Infos	SV	L,n 1. <Shelf Info> ... n. <Shelf Info>	Shelf Info: VID 17
9	Active Alarms	SV	L,n 1. <AlarmInfo> ... n. <AlarmInfo>	VID=18
10	Active Unit Alarms	SV	L,n 1. <UnitAlarmInfo> ... n. <UnitAlarmInfo>	VID=19

5.2.1 Basic

VID	Name	Class	Format	Details
11	CarrierInfo	SV/DV	L,2 <A,64 CarrierID> <A,64 CarrierLoc>	• Reticle Stocker 의 경우 CarrierID 는 ReticleID 임
12	TransferCommand	SV/DV	L,2 <CommandInfo> <TransferInfo>	
13	CommandInfo	SV/DV	L,2 <A,64 CommandID> <U2,1 Priority>	Priority 1~99
14	TransferInfo	SV/DV	L,4 <A,64 CarrierID> <A,64 CarrierLoc> <A,64 Source> <A,64 Dest>	
15	ZoneData	SV/DV	L,3 <A,64 Zone Name> <U2,1 Zone Capacity> <U2,1 Max Capacity>	
16	UnitInfo	SV/DV	L,3 <A,64 Unit ID <U2,1 Unit State <U2,1 Unit Status	Port or Crane(RM)
17	Shelf Info	SV	L,4 <A,64 Shelf Unit ID <A,64 Zone Name <U2,1 Shelf Unit State <A,64 Carrier ID	Shelf Unit State는 Unit State와 동일함
18	Alarm Info	SV	L3 <B,1 Alarm code <U2,1 Alarm ID <A, 128 Alarm Text	
19	Unit Alarm Info	SV/DV	L3 <A,64 UnitID <U2,1 Alarm ID <A, 128 Alarm Text	Unit Alarm Set/Clear

5.2 VID

5.2.1 Basic

VID	Name	Class	Format	Details
20				
21				
22				
23				
24	CarrierInfo2	SV/DV	L,2 <A,64 CarrierID> <A,64 SubCarrierID> <A,64 CarrierLoc>	Reticle Stocker Only

5.2.2 Transfer & Device

VID	Name	Class	Format	Details
101	CommandID	DV	A,64	
102	CarrierID	DV	A,64	
103	UnitID	DV	A,64	CraneID, PortID, ShelfID
104	ErrorID	DV	A,64	DestOccupied SourceEmpty Others 추가 가능성 있음
105	Unit State	SV/DV	U2	Unit: Port, Crane, Shelf 1: OutofService 2: Inservice 3: TransferBlock
106	Unit Status	SV/DV	U2	Unit: Port, Crane, Shelf 1: Empty 2: Occupied(Full)
107	Transfer State	DV	U2,1	Transfer State 1: Queued 2: Transferring 3: Paused 4: Canceling 5: Aborting
108	Carrier State	DV	U2,1	Carrier State 0: None 1: Wait In 2: Transferring 3: Completed 4: Alternate 5: Wait Out
109				
110				
111				

5.2.2 Transfer & Device

VID	Name	Class	Format	Details
*** 112**	SubCarrierID	DV	A,64	* Reticle Stocker 전용
*** 113**	EmptyCarrierCount	DV	U2	* Reticle Stocker 전용

5.2.3 Option & err code

VID	Name	Class	Format	Details
201	Recovery Option	DV	A,64	blank RETRY ABORT
202	Result code	DV	U2,1	Transfer complete 항목 0: Success 1: Other Error 2: Shelf zone is full 3: Duplicate ID 4: Mismatch ID 5: Failure to Read ID
203	PortType	DV	A,20	LP, BP, OP LP: Loading port BP: Buffer port OP: Output port
204	CommandType	DV	A,20	Operator initiated action에서 사용하는 반송 타입 TRANSFER CANCEL ABORT
205	Failure Code	DV	U2,1	RCMD 대응 S6F11항목 1: Undefined Failure 2: Location Occupied (Install Rcmd 시) 3: Carrier Not Exist (Remove Rcmd 시)
206	HandoffType	DV	U2,1	1: Manual 2: Automated
207	IDRead Status	DV	U2,1	0: OK 1: Fail 2: Duplicate 3: Mismatch
208	IDRead Duplicate-option	SV/ECV/DV	U2,1	0: Reject 1: Host control
209	IDRead Failure-option	SV/ECV/DV	U2,1	0: Reject 1: Host control
210	IDRead Mismatch-option	SV/ECV/DV	U2,1	0: Reject 1: Host control

5.3.1 Remote Command Name (S2F41, F49)

RCMD	CPNAME	REQ/OPT	COMMENT
ABORT	COMMANDID	R	Active중인 반송명령을 Command ID로 찾아 종료시킨다. Equipment의 특정한 상태에 따라 실행여부가 결정 된다
CANCEL	COMMANDID	R	Queued중인 반송명령을 Command ID로 찾아 종료시킨다. Equipment상태에 상관없이 가능하다
INSTALL	CARRIERID CARRIERLOC	R	SC의 Database에 특정한 Carrier 정보를 입력시킨다.
LOCATE	CARRIERID	R	카세트의 정보(위치) 조회
PAUSE	NONE	N/A	실행 예정 (Queued) 또는 현재 실행중인 반송명령을 일시 중지
REMOVE	CARRIERID	R	해당하는 Carrier 정보를 SC Database에서 지운다.
RESUME	NONE	N/A	장비 Pause상태 -> Auto(실행가능) 상태 변경 요청
TRANSFER (S2F49)	COMMANDINFO CARRIERINFO	R R	Carrier를 현재 위치 (Source) 에서 특정 위치 (Destination)으로 반송 하도록 명령을 내린다

5.3.2 Remote Command Parameters

CPNAME	Format	COMMENT
COMMANDID	A[64]	MCS에서 발생되는 명령의 고유식별번호
PRIORITY	U2[1]	Remote Command의 실행 순위 0 : Not Valid Low 1 ~ 99 High
CARRIERID	A[64]	Unique Carrier Id
CARRIERLOC	A[64]	Unique Carrier Location Within The Stocker
SOURCE	A[64]	Unique Source Location
DEST	A[64]	Destination Location

CPNAME GROUP	COMMENT
COMMANDINFO	<L2 <COMMANDID <PRIORITY
TRANSINFO	<L3 <CARRIERID <SOURCE <DEST

5.4.1 S1F1-Are You There

Stream	Function	Description	Wait bit	Direction
1	1	Establish if the equipment is on line	True	H<->E
HEADER ONLY.				

Stream	Function	Description	Wait bit	Direction
1	2	Data signifying that the equipment is alive	False	H<-E
< L, 2 < A[64] MDLN> * Model Number of the equipment < A[64] SOFTREV> * Software Revision				

Stream	Function	Description	Wait bit	Direction
1	2	Data signifying that the host is alive	False	H->E
< L, 0				

5.4.2 S1F3

Stream	Function	Description	Wait bit	Direction
1	3	HOST QUERY AMHS EQ INFO	True	H->E

```
<L,9
       <U2,1 2>  /*control state */
       <U2,1 3>  /*SC state */
       <U2,1 4>  /Active Carriers
       <U2,1 5>  /Active Transfers
       <U2,1 6>  /Active Zones
       <U2,1 7>  /All Unit info
       <U2,1 8>  /All Shelf info
       <U2,1 10> /현재 발생 알람 id list
```

S1F3의 VID는 MCS 가 추가 및 변경 가능하며
SC는 VID의 SV class에 대해
S1F4에 해당 내용을 대응 가능하여야 한다.

예제 Reply 메시지 다음 페이지에 기술함

Stream	Function	Description	Wait bit	Direction
1	4		False	H<-E

```
<L,8
       <U2,1 Control state
       <U2,1 SC state
       <L n Carrier info
              <L 2
                     <A,64 CarrierID
                     <A,64 Carrier Loc
       <L,n
              <L,2 Transfer command
                     <L,2 Command info
                            <A,64 CommandID
                            <U2,1 Priority
                     <L,4 Carrier Info
                            <A,64 CarrierID
                            <A,64 CarrierLoc
                            <A,64 Source
                            <A,64 Dest
       <L,n  Zone info
              <L,2
                     <A,64 Zone Name
                     <U2,1 Zone Capacity
                     <U2,1 Zone MaxCapacity
       <L,n  Unit info
              <L,3
                     <A,64 Unit ID
                     <U2,1 Unit state
                     <U2,1 Unit status
       <L,n  Shelf info
              <L,4
                     <A,64 Shelf ID
                     <A,64 Zone Name
                     <U2,1 Shelf Unit State
                     <A,64 Carrier ID
       <L,n Active Unit Alarms
              <L,3
                     <A,64  Unit ID
                     <U2,1  Alarm ID
                     <A,128 Alarm text
```

5.4.3 S1F13-Establish Communication Request

Stream	Function	Description	Wait bit	Direction
1	13	Initialize communications at a logical application level both on power-up and following a break in communications.	True	H<->E
E->H <L 2 <A,64 MDLN> <A,64 SOFTREV>				
H->E <L 0				

Stream	Function	Description	Wait bit	Direction
1	14	Accept or deny Establish Communication Request	False	H<->E
E->H <L 2 <B[1] COMMACK> <L 2 <A,64 MDLN> <A,64 SOFTREV>				
H->E <L 2 <B[1] COMMACK> <L 0				

5.4.4 S1F15-Offline Request

Stream	Function	Description	Wait bit	Direction
1	15	The Host requests that the equipment transaction to the OFF-LINE state.	True	H->E
Header Only				

Stream	Function	Description	Wait bit	Direction
1	16	Acknowledge or Error.	False	H<-E
<B[1] OFLACK				

5.4.5 S1F17-Online Request

Stream	Function	Description	Wait bit	Direction
1	17	The Host requests that the equipment transaction to the ON-LINE state.	True	H->E

Stream	Function	Description	Wait bit	Direction
1	18	Acknowledge or Error.	False	H<-E

<B[1] ONLACK

0: OK
1: Not-Allowed
2: Already online

5.4.10 S2F31-Date time set

Stream	Function	Description	Wait bit	Direction
2	31	Useful to synchronize the equipment time with the host time base.	True	H->E
<A[16] TIME				

Stream	Function	Description	Wait bit	Direction
2	32	Acknowledge the receipt of time and date.	False	H<-E
<B[1] TIACK				

5.4.12 S2F41-Host Command Send (Install)

Stream	Function	Description	Wait bit	Direction
2	41	SC DB Update By Carrier Id	True	H->E

```
< L, 2
    < A[64] RCMD > * 'INSTALL'
    < L, 3
        <L, 2
            <A,64 CPNAME > * 'CARRIERID'
            <A,64 CPVAL > * CarrierID
        <L, 2
            <A,64 CPNAME > *  'CARRIERLOC'
            <A,64 CPVAL > * Carrier Current Location
        <L, 2
            <A,64 LOTID> *  'LOTID'
            <A,64 CPVAL > * LOTID value
```

5.4.13 S2F41-Host Command Send (Locate)

Stream	Function	Description	Wait bit	Direction
2	41	Host에서 Locate를 이용하여 조회 요청 S6F11 LocateComplate 보고	True	H->E

```
< L, 2
    < A[64] RCMD > * LOCATE
    < L ,1
        <L, 2
            <A,64 CPNAME > * CARRIERID
            <A,64 CPVAL > * CarrierID
```

5.4.14 S2F41-Host Command Send (Remove)

Stream	Function	Description	Wait bit	Direction
2	41	SC DB Delete by carrier id	True	H->E

```
< L, 2
    < A[64] RCMD > * REMOVE
    < L ,1
        <L, 2
            <A,64 CPNAME > * CARRIERID
            <A,64 CPVAL > * CarrierID
```

5.4.15 S2F41-Host Command Send (Update)

Stream	Function	Description	Wait bit	Direction
2	41	Destination, Priority 변경	True	H->E

```
< L, 2
    < A[64] RCMD > * UPDATE
    < L, 4
        <L, 2
            <A,64 CPNAME > * CARRIERID
            <A,64 CPVAL >  * CarrierID
        <L, 2
            <A,64 CPNAME > * DEST
            <A,64 CPVAL >  * Dest
        <L, 2
            <A,64 CPNAME > * DESTLOC
            <A,64 CPVAL >  * Destination Shelf Location or Destination Port
        <L, 2
            <A,64 CPNAME > * PRIORITY'
            <U2[1] CPVAL > * Priority
```

5.4.16 S2F41-Host Command Send (Cancel)

Stream	Function	Description	Wait bit	Direction
2	41	The Host Requests the Equipment perform the specified remote command with the associated parameters.	True	H->E

```
< L, 2
    < A[64] RCMD > * CANCEL
    < L ,1
        <L, 2
            <A,64 CPNAME > * COMMANDID
            <A,64 CPVAL >  * CommandId
```

5.4.17 S2F41-Host Command Send (Abort)

Stream	Function	Description	Wait bit	Direction
2	41	The Host Requests the Equipment perform the specified remote command with the associated parameters.	True	H->E

```
< L, 2
    < A[64] RCMD > * ABORT
    < L ,1
        <L, 2
            <A,64 CPNAME > * COMMANDID
            <A,64 CPVAL >  * CommandId
```

5.4.18 S2F41-Host Command Send (Pause)

Stream	Function	Description	Wait bit	Direction
2	41	The Host Requests the Equipment perform the specified remote command with the associated parameters.	True	H->E

< L, 2
    < A[64] RCMD > * PAUSE
    < L ,0

5.4.19 S2F41-Host Command Send (Resume)

Stream	Function	Description	Wait bit	Direction
2	41	The Host Requests the Equipment perform the specified remote command with the associated parameters.	True	H->E

```
< L, 2
    < A[64] RCMD > * RESUME
    < L ,0
```

5.4.22 S2F42

Stream	Function	Description	Wait bit	Direction
2	42	Acknowledge Host command or error. If command is not accepted due to one or more invalid parameters.	False	H<-E

No Error

```
< L, 2
    < B[1] HCACK >  0
    < L ,0
```

Some Error

```
< L, 2
    < B[1] HCACK >  3
    < L ,2
        <L, 2
            <A,64 CPNAME > Command Parameter Name
            <B[1] CPVAL >  Control Parameter Ack Code
       ..................
       <L, 2
            <A,64 CPNAME > Command Parameter Name
            <B[1] CPVAL >  Control Parameter Ack Code
```

- 같은 Command에 대해서는 HCACK= 5 요청
- 0 : Acknowledge, command has been performed
- 1 : Command does not exist
- 2 : Cannot perform now
- 3 : At least one parameter is invalid
- 4 : Acknowledge, command will be performed with completion signaled later by an event
- 5 : Rejected, Already in Desired Condition
- 6 : No such object exist
- 7 - 63 : Reserved

5.4.23 S2F49-Transfer

Stream	Function	Description	Wait bit	Direction
2	49		True	H->E

```
< L, 4
    < U2 DATAID>
    < A[64] OBJSPEC>
    < A[64] RCMD> * TRANSFER
    < L 2
        <L, 2
            <A,64 CPNAME > * COMMANDINFO'
            <L, 2
                <L, 2
                    <A,64 CPNAME > * COMMANDID''
                    <A,64 CPVAL >  * CommandID
                <L, 2
                    <A,64 CPNAME > * PRIORITY'
                    <U2[1] CPVAL > * Priority
       <L, 2
             <A,64 CPNAME > * TRANSFERINFO
             <L, 3
                <L, 2
                    <A,64 CPNAME > * 'CARRIERID'
                    <A,64 CPVAL >  * CarrierID
                <L, 2
                    <A,64 CPNAME > * 'SOURCE' * ZONENAME, PORTID
                    <A,64 CPVAL >  * Source
                <L, 2
                    <A,64 CPNAME > * 'DEST' * ZONENAME, PORTID
                    <A,64 CPVAL >  * Destination
```

5.4.25 S2F50 Enhanced Remote Command Acknowledge

Stream	Function	Description	Wait bit	Direction
2	50	The equipment acknowledge Enhanced Remote Command or reports any errors. If the command is not accepted due to one or more invalid parameters, (i.e. HCACK=3), then a list of invalid parameters will be returned containing the parameter name and reason for being invalid.	False	H<-E

No Error

```
< L, 2
    < B[1] HCACK >  0
    < L ,0
```

Some Error

```
< L, 2
    < B[1] HCACK >  3
    < L ,2
        <L, 2
            <A,64 CPNAME > Command Parameter Name
            <B[1] CPEACK >     Control Parameter Ack Code
       ..................
       <L, 2
            <A,64 CPNAME > Command Parameter Name
            <B[1] CPEACK >     Control Parameter Ack Code
```

- 같은 Command에 대해서는 HCACK= 5 요청
- 0 : Acknowledge, command has been performed
- 1 : Command does not exist
- 2 : Cannot perform now
- 3 : At least one parameter is invalid
- 4 : Acknowledge, command will be performed with completion signaled later by an event
- 5 : Rejected, Already in Desired Condition
- 6 : No such object exist
- 7 - 63 : Reserved

5.4.26 S3F101-LOT INFO SEND

Stocker에서 작업자 carrier 배출 시 LotID 및 기타 정보를 표현하기 위해
Carrier stored 시점에 MCS에서 아래 정보를 보내며
Controller는 이 정보를 저장 및 화면에 표시하여야 한다
항목은 향후 추가될 수 있음

Stream	Function	Description	Wait bit	Direction
3	101	Lot Info Send	True	H->E

```
<L, 10
       <L, 2
              <A,64 $VNAME > * CUSTOMER
              <A,64 $VVAL >  * Customer value
       <L, 2
              <A,64 $VNAME > * STRIPMARKING
              <A,64 $VVAL >  * Strip marking
       <L, 2
              <A,64 $VNAME > * LOTNUMBER
              <A,64 $VVAL >  * Lot Number value
       <L, 2
              <A,64 $VNAME > * CARRIERID
              <A,64 $VVAL >  * CarrierID
       <L, 2
              <A,64 $VNAME > * LOTID
              <A,64 $VVAL >  * LOTID
       <L, 2
              <A,64 $VNAME > * SUBID
              <A,64 $VVAL >  * SUBID Value
       <L, 2
              <A,64 $VNAME > * LOTTYPE
              <A,64 $VVAL >  * LOTTYPE Value
       <L, 2
              <A,64 $VNAME > * DCC
              <A,64 $VVAL >  * DCC Value
       <L, 2
              <A,64 $VNAME > * OP
              <A,64 $VVAL >  * OP Value            * STEP ID
       <L, 2
              <A,64 $VNAME > * CustName
              <A,64 $VVAL >  * CustName Value
```

Stream	Function	Description	Wait bit	Direction
3	102	Lot Info Send Ack	False	H<-E

```
< B [1] LIACK>
```

5.4.27 S5F1-Alarm Report

Stream	Function	Description	Wait bit	Direction
5	1	This message reports a change in or presence of an alarm condition.	True	H<-E
< L, 3 < B [1] ALCD> < U2 [1] ALID> < A[128] ALTX>		* Alarm Code * Alarm Id * Alarm Text		

Stream	Function	Description	Wait bit	Direction
5	2	Acknowledge or error.	False	H->E
< B [1] ACKC5>				

5.4.28 S5F3-Alarm Valid/Invalid Setting

Stream	Function	Description	Wait bit	Direction
5	3	Enable/Disable Alarms	True	H->E

```
< L, 2
    < B [1]  ALED>          * Alarm Valid/Invalid Code
    < U2 [1] ALID>          * Alarm Id
```

Stream	Function	Description	Wait bit	Direction
5	4	Acknowledge to Alarm Valid/Invalid Setting	False	H->E

```
< B [1] ACKC5>
```

5.4.29 S5F5-Alarm List

Stream	Function	Description	Wait bit	Direction
5	5	This message reports a change in or presence of an alarm condition.	True	H<-E

```
< L, n
    < U2 [1] ALID>          * Requested Alarm Id
    ...................
    < U2 [1] ALID>          * Requested Alarm Id

Or
<L, 0 : 전체 알람 요청
```

Stream	Function	Description	Wait bit	Direction
5	6	Acknowledge to Alarm List Request	False	H->E

```
<L, n
    < L, 3
        < B [1] ALCD>          * Alarm Code
        < U2 [1] ALID>         * Alarm Id
        < A[128] ALTX>        * Alarm Text
    ...................
    < L, 3
        < B [1] ALCD>          * Alarm Code
        < U2 [1] ALID>         * Alarm Id
        < A[128] ALTX>        * Alarm Text
```

5.4.30 S6F11 (RPTID 1)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=1
            <L, 3
              <A,64 EqpName>          [VID: 1]
              <U2,1 Control state>    [VID: 2]
              <U2,1 SC state>         [VID: 3]
```

CEID	Event Name
1101	Offline
1102	Local
1103	Remote
1201	Auto Init.
1202	Auto comp
1203	Pause Init.
1204	Pause comp.
1205	Paused

5.4.33 S6F11 (RPTID 4)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=4
            <L, 2
              <L,2     [VID: 11]
                     <A,64 CarrierID>
                     <A,64 Carrier Loc>
              <U2[1] IDReadStatus>     [VID: 207]
```

CEID	Event Name
2101	Carrier ID Read

5.4.34 S6F11 (RPTID 5)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=5
            <L, 1
              <L,2      [VID: 11]
                      <A,64 CarrierID>
                      <A,64 Carrier Loc>
```

CEID	Event Name
2102	Carrier Waitin
2103	Carrier transferring
2104	Carrier stored
2105	Carrier stored alt
2106	Carrier wait out
* 2110	Carrier Wait In(Reticle)
2201	Carrier install comp.
2202	Carrier remove comp.
2203	Carrier locate comp.

5.4.35 S6F11 (RPTID 6)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=6
            <L, 2
              <L,2      [VID: 11]
                      <A,64 CarrierID>
                      <A,64 Carrier Loc>
              <U2[1] HandoffType>  [VID:206]
```

CEID	Event Name
2107	Carrier removed

5.4.37 S6F11 (RPTID 7)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=7
            <L, 2
              <L,2     [VID:13]
                       <A,64 CommandID>
                       <U2,1 Priority>
              <L,4     [VID:14]
                       <A,64 CarrierID>
                       <A,64 CarrierLoc>
                       <A,64 Source>
                       <A,64 Dest>
```

CEID	Event Name	RPTID
3101	Transfer Initiated	
3103	Transfer Paused	
3104	Transfer Resumed	
3201	Transfer Abort Initiated	
3202	Transfer Abort completed	
3203	Transfer Abort Failed	
3301	Transfer Cancel initiated	
3302	Transfer Cancel Completed	
3303	Transfer Cancel Failed	

5.4.37 S6F11 (RPTID 8)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=8
            <L,3
              <L,2     [VID:13]
                       <A,64 CommandID>
                       <U2,1 Priority>
              <L,4     [VID:14]
                       <A,64 CarrierID>
                       <A,64 CarrierLoc>
                       <A,64 Source>
                       <A,64 Dest>
              <U2,1 ResultCode>     [VID:202]
```

CEID	Event Name	RPTID
3102	Transfer complete	

5.4.38 S6F11 (RPTID 9)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=9
            <L,3
              <L,2     [VID:13]
                       <A,64 CommandID>
                       <U2,1 Priority>
              <L,4     [VID:14]
                       <A,64 CarrierID>
                       <A,64 CarrierLoc>
                       <A,64 Source>
                       <A,64 Dest>
              <A,20 CommandType        [VID:204]
```

CEID	구분	Event Name
4301		Operator init action

5.4.39 S6F11 (RPTID 10)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=10
            <L 2
              <L2       [VID:13]
                      <A,64 CommandID>
                      <U2,1 Priority>
              <A,64 UnitID>   CraneID 입력  [VID:103]
```

CEID	Event Name
4101	ACTIVE
4102	IDLE

5.4.41 S6F11 (RPTID 11)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=11
            <L, 2
              <A,64 UnitID> CraneID, PortID, ShelfID 입력  [VID:103]
              <U2[1] Unit State>    [VID: 105]
```

CEID	Event Name
5101	Unit state changed (1: OutofService, 2: Inservice)

5.4.41 S6F11 (RPTID 12)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=12
            <L, 2
              <A,64 UnitID> CraneID, PortID, ShelfID 입력  [VID:103]
              <U2[1] Unit Status> [VID: 106]
```

CEID	Event Name
5102	Unit status changed (1: Empty, 2: Occupied)

5.4.42 S6F11 (RPTID 13)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
       < L, 2
              <U2 [1] RPTID> * Report ID=13
              <L,1
                     <L, 3     [VID: 15]
                            <A,64 Zone Name>
                            <U2,1 Zone Capacity>
                            <U2,1 Max Capacity>
```

CEID	Event Name
4201	Zone Capacity Change

5.4.43 S6F11 (RPTID 14)

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=14
            <L, 1
               <L, 3                [VID: 19]
                  <A,64  Unit ID>
                  <U2,1  AlarmID>
                  <A,128 AlarmText>
```

CEID	Event Name
1303	Unit Alarm Set
1304	Unit Alarm Clear

5.4.34 S6F11 (RPTID 17) – Reticle Stocker Only

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=17
            <L, 1
              <L,3      [VID: 24]
                      <A,64 CarrierID>
                      <A,64 SubCarrierID>
                      <A,64 Carrier Loc>
```

CEID	Event Name
2108	Carrier stored
2109	Carrier wait out
2204	Carrier Install Complete

5.4.34 S6F11 (RPTID 18) – Reticle Stocker Only

Stream	Function	Description	Wait bit	Direction
6	11	The equipment send event	True	H<-E

```
< L, 3
    < U2 [1] DATAID>
    < U2 [1] CEID>
    <L, 1
        < L, 2
            <U2 [1] RPTID> * Report ID=18
            <L, 1
              <L,2
                      <A,64 Eqp Name> [VID:1]
                      <U2,1 EmptyCarrierCount> [VID:113]
```

CEID	Event Name
6101	Empty Carrier Info

5.4.45 S6F11-Event Report Acknowledge

Stream	Function	Description	Wait bit	Direction
6	12	Acknowledge or error.	False	H->E
<B1 ACKC6>.				

5.4.46 S9F1/3/5/7/9-Transaction Error

Stream	Function	Description	Wait bit	Direction
9	1	Unrecognized Device ID.	False	H<-E
<MHEAD B[10]>				

Stream	Function	Description	Wait bit	Direction
9	3	Unrecognized Stream Type	False	H<-E
<MHEAD B[10]>				

Stream	Function	Description	Wait bit	Direction
9	5	Unrecognized Function Type	False	H<-E
<MHEAD B[10]>				

Stream	Function	Description	Wait bit	Direction
9	7	Illegal Data	False	H<-E
<MHEAD B[10]>				

Stream	Function	Description	Wait bit	Direction
9	9	Transaction Timer time-out	False	H<-E
<SHEAD B[10]>				

5.4.47 S10F3-Terminal Display (Single)

Stream	Function	Description	Wait bit	Direction
10	3	Terminal Display, Single	True	H->E

```
< L, 2
    < B [1] TID>            * Terminal Id
    < A[1024] TEXT>         * Terminal Text
```

Stream	Function	Description	Wait bit	Direction
10	4	Acknowledge or error.	False	H<-E

```
< B [1] ACKC10>
```

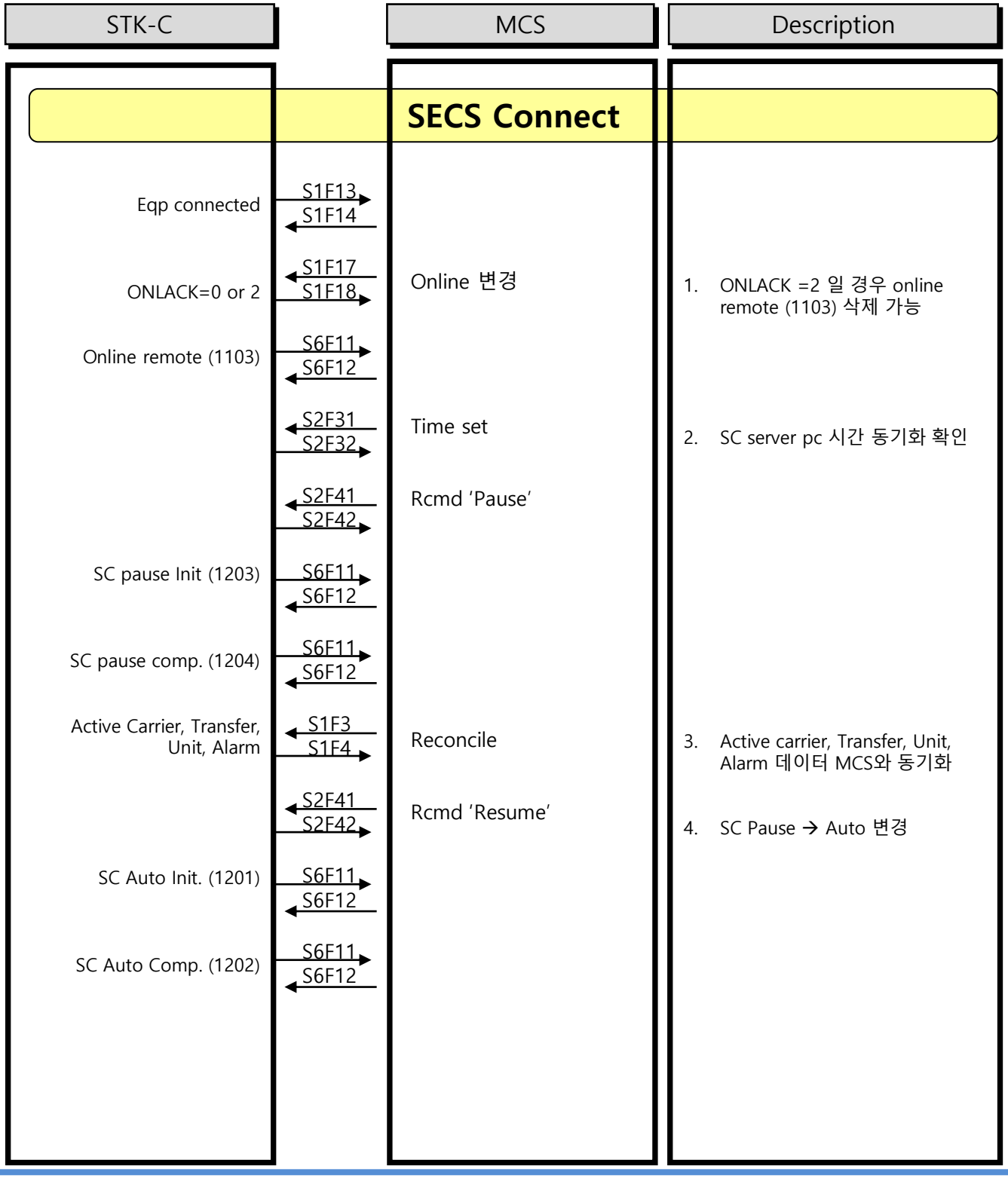
*** Controller Display 가능 시 추가 예정**

PART 06 SCENARIO

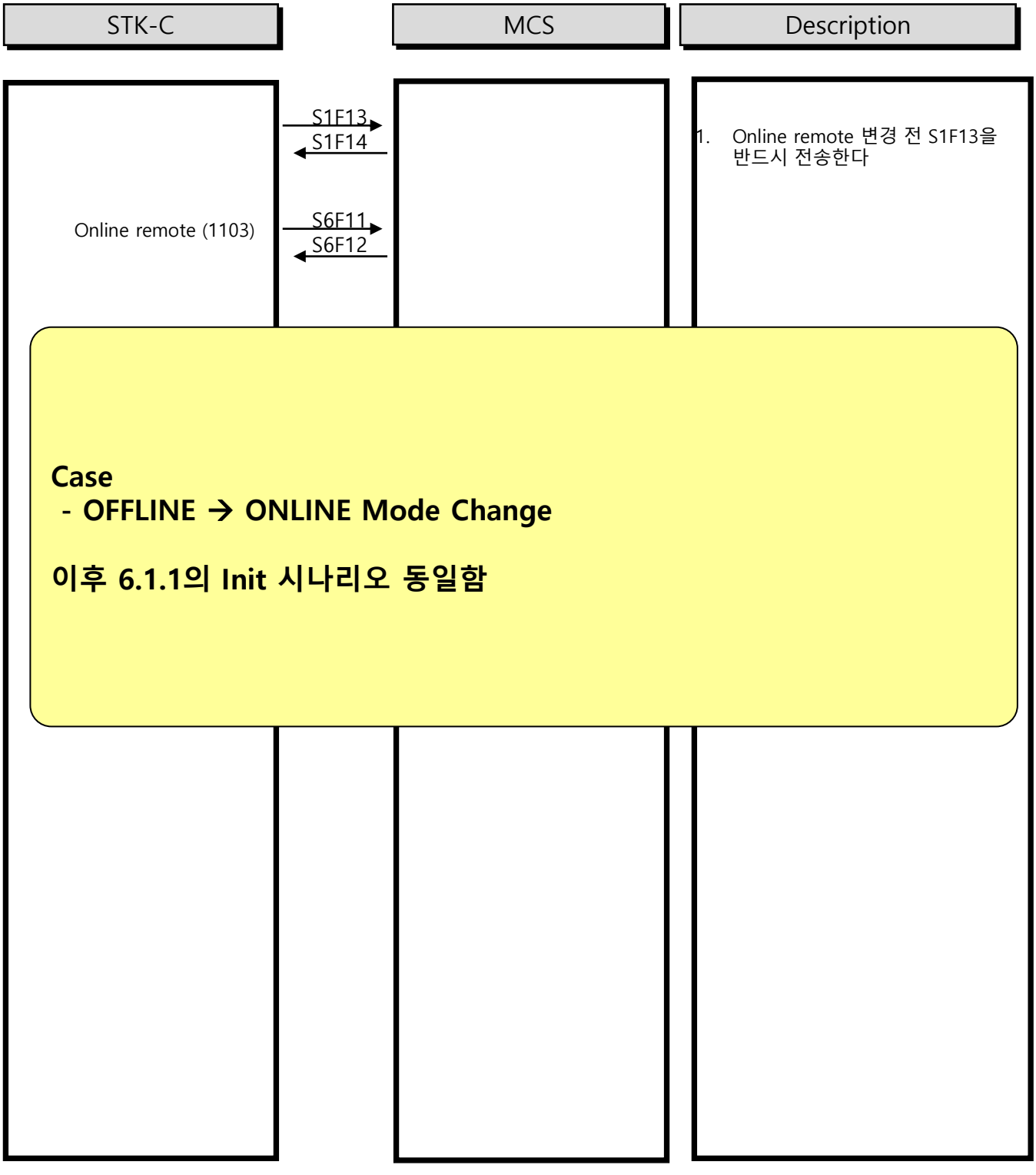
1. Initialize
2. Mode Change
3. Scenario
4. Data Management
5. Remote Command
6. Abnormal ScenarioAlarm
7. Operator Init Action
8. Reticle Scenario

6.1 Initialize

6.1.1 Initialize On connect

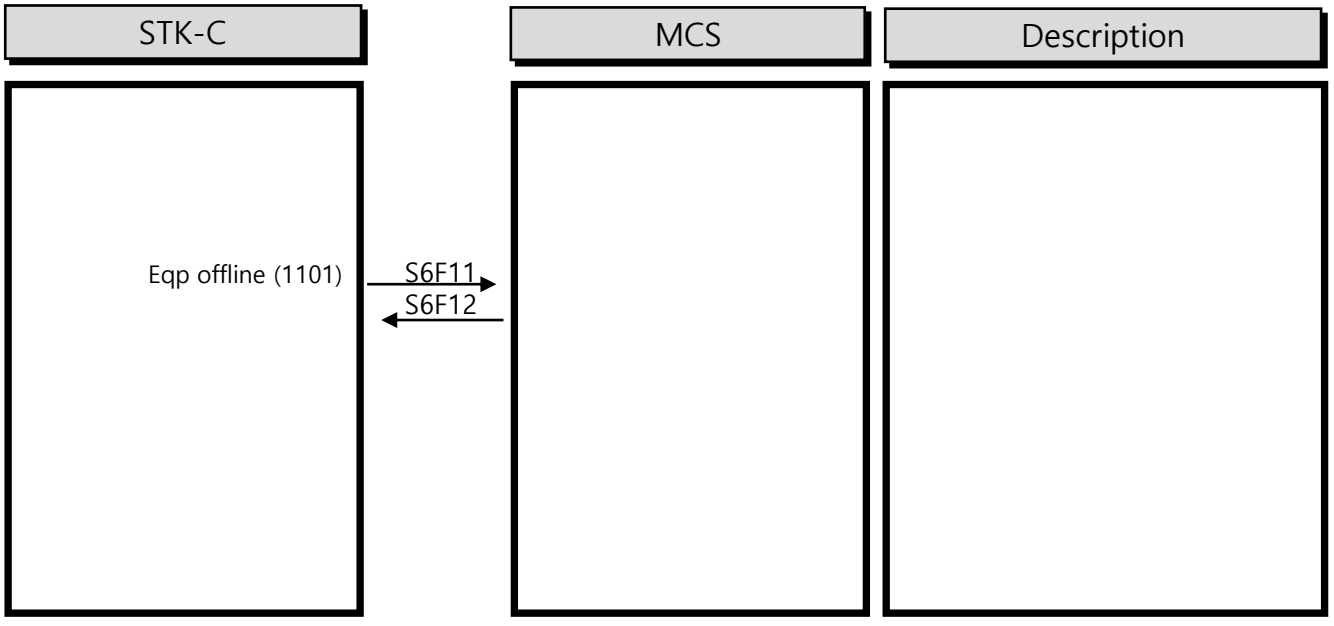


6.1.2 Initialize By Eqp Offline -> Remote

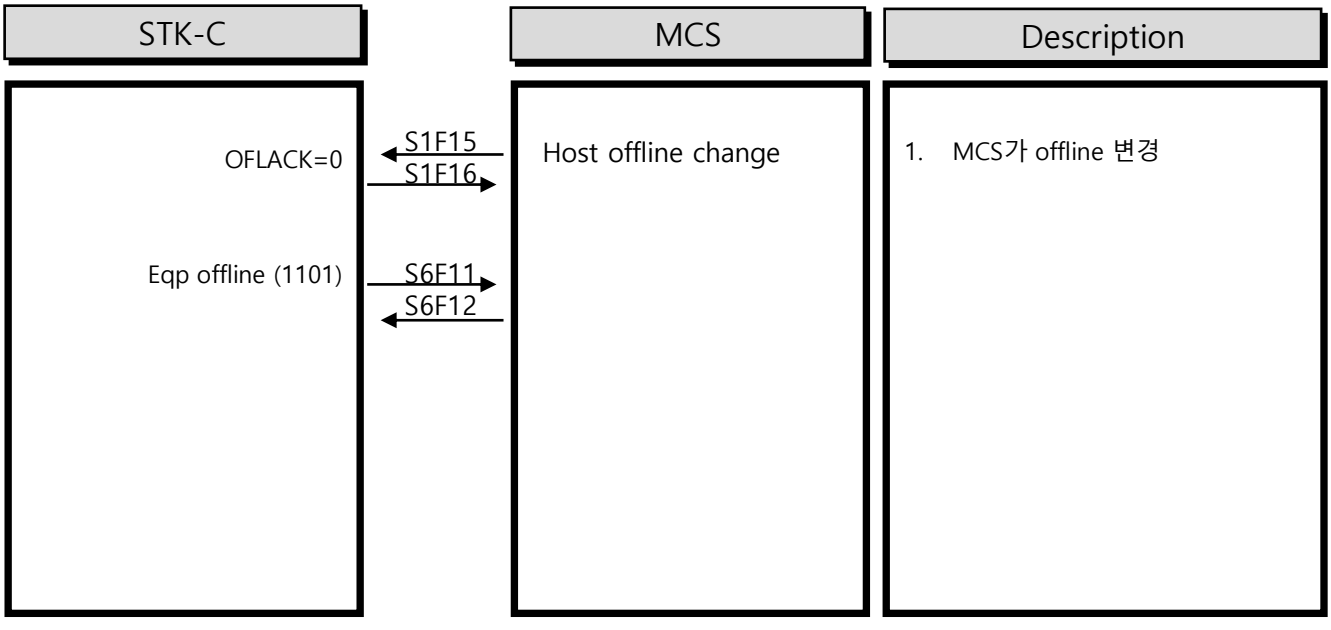


6.2 Mode change

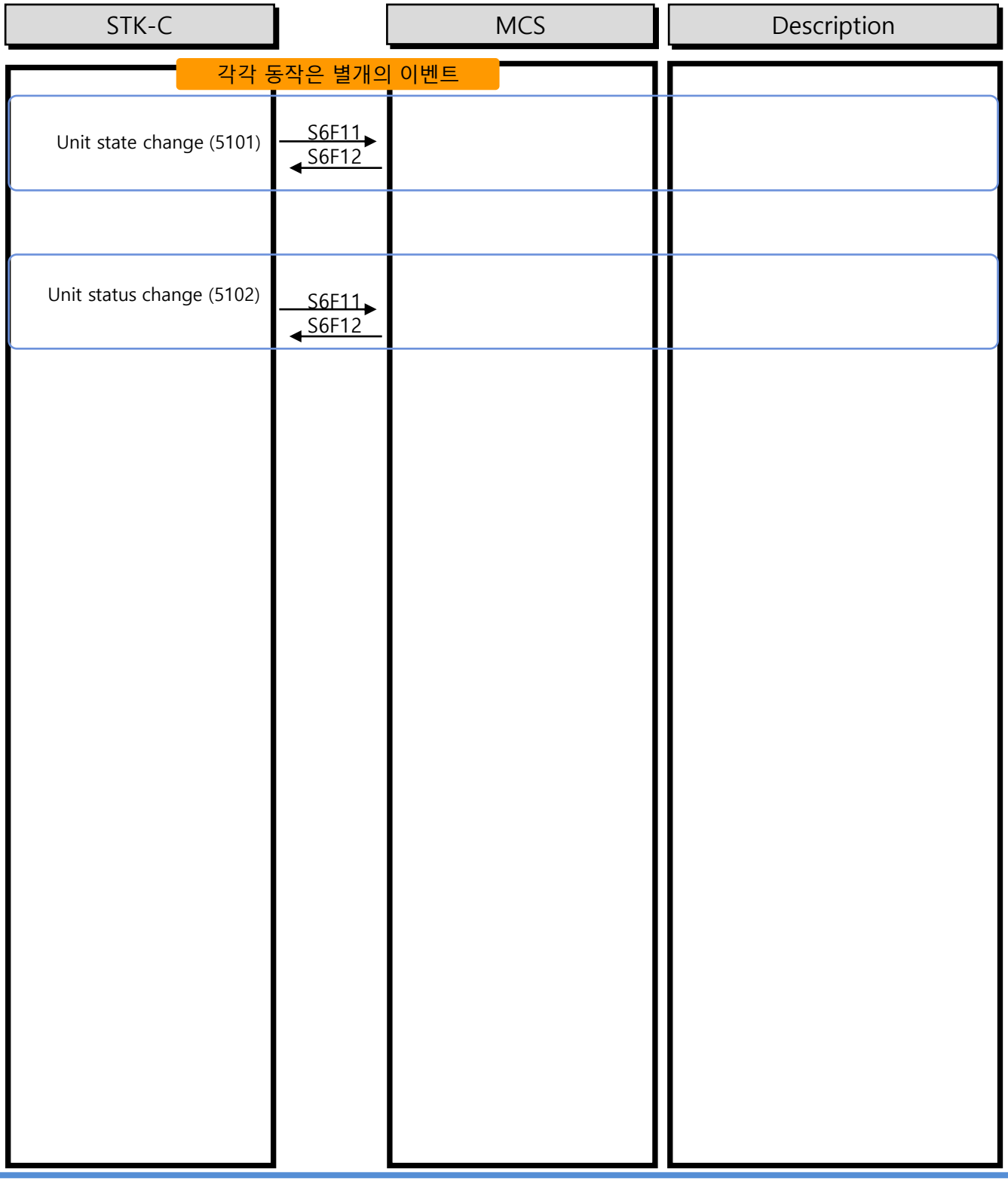
6.2.1 On-line -> Off-line (By Equipment)



6.2.2 On-line -> Off-line (By MCS)

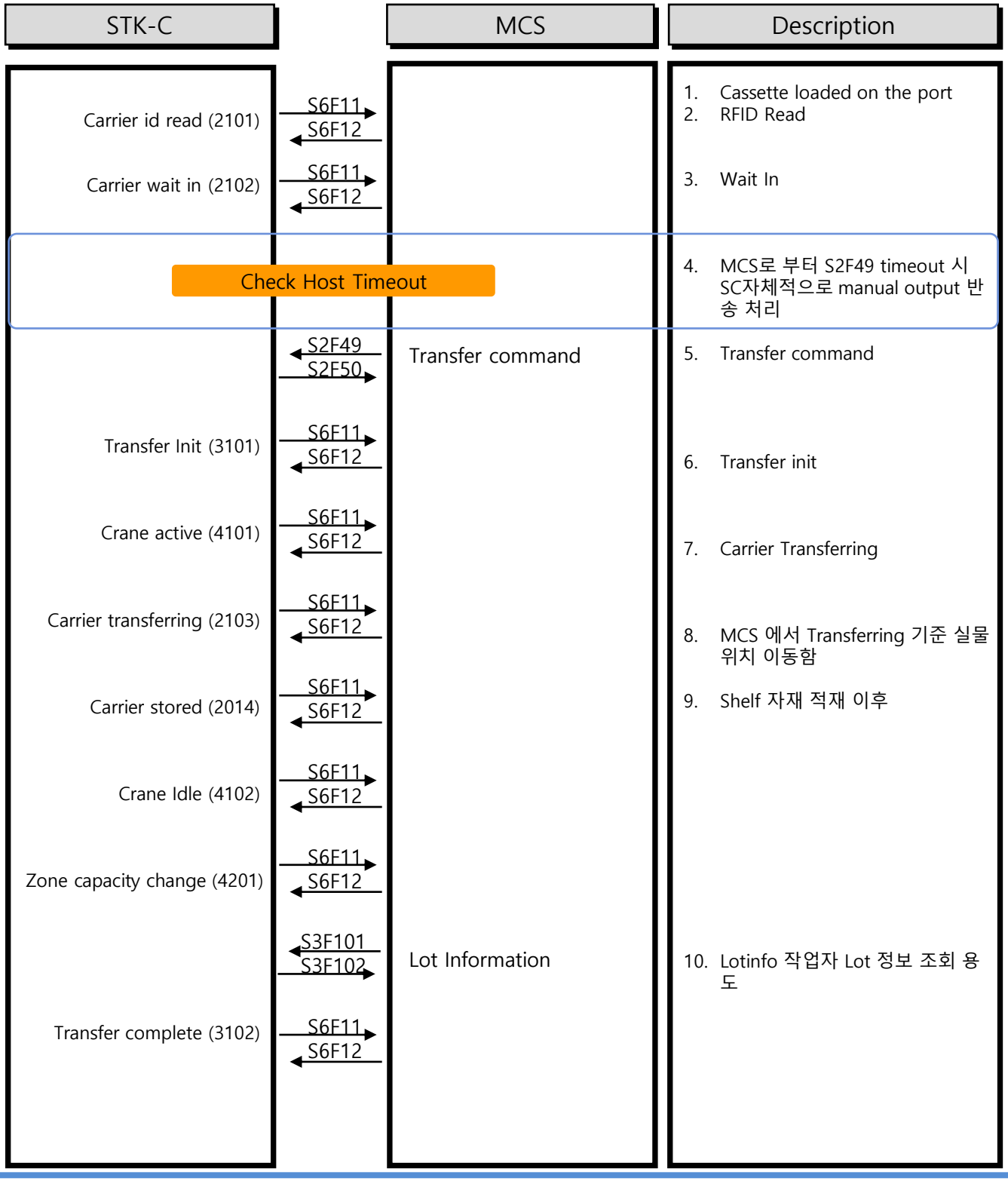


6.2.3 STK 기타 이벤트

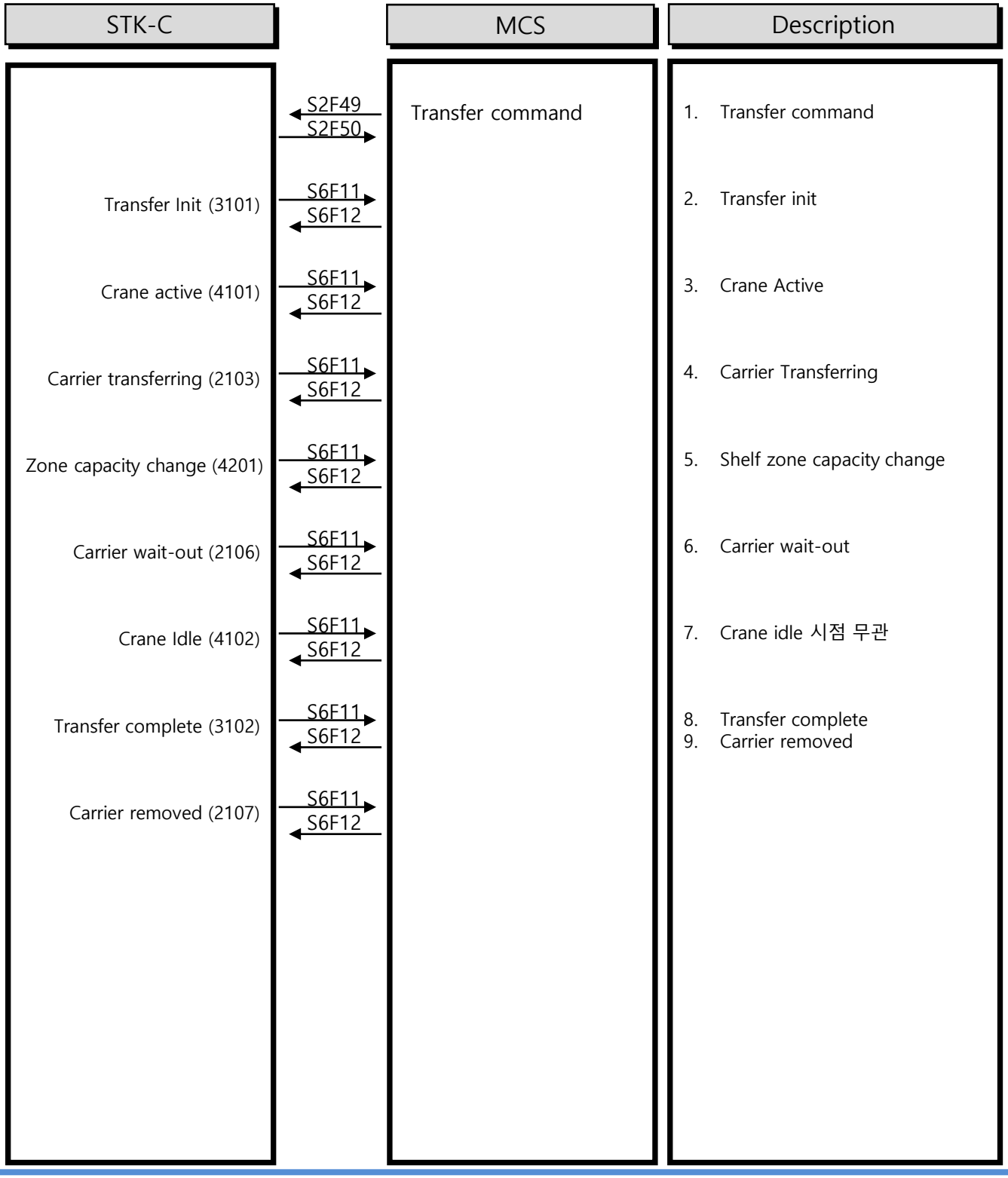


6.3 Scenario

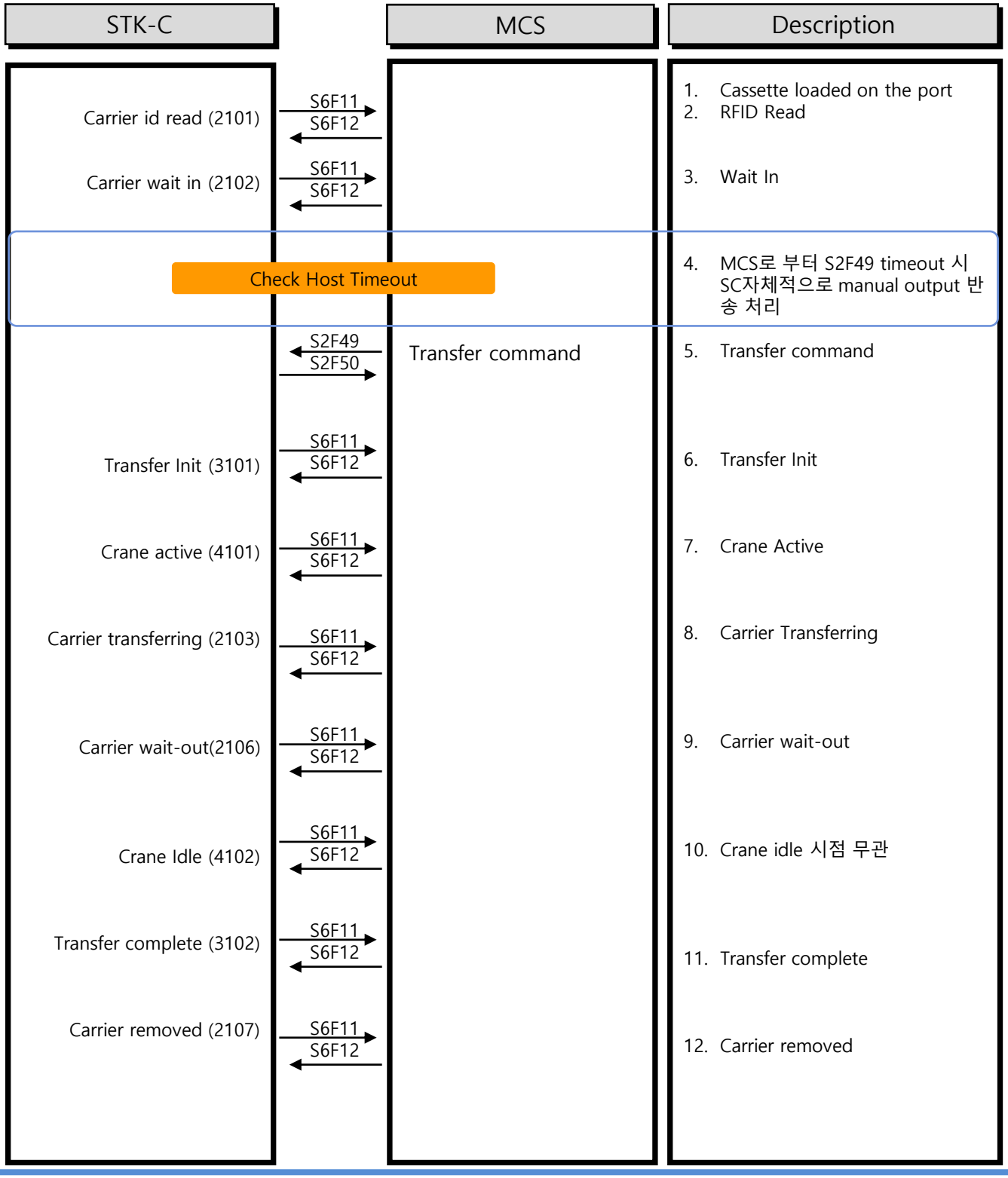
6.3.1 Input Port -> Shelf



6.3.2 Shelf -> Output Port

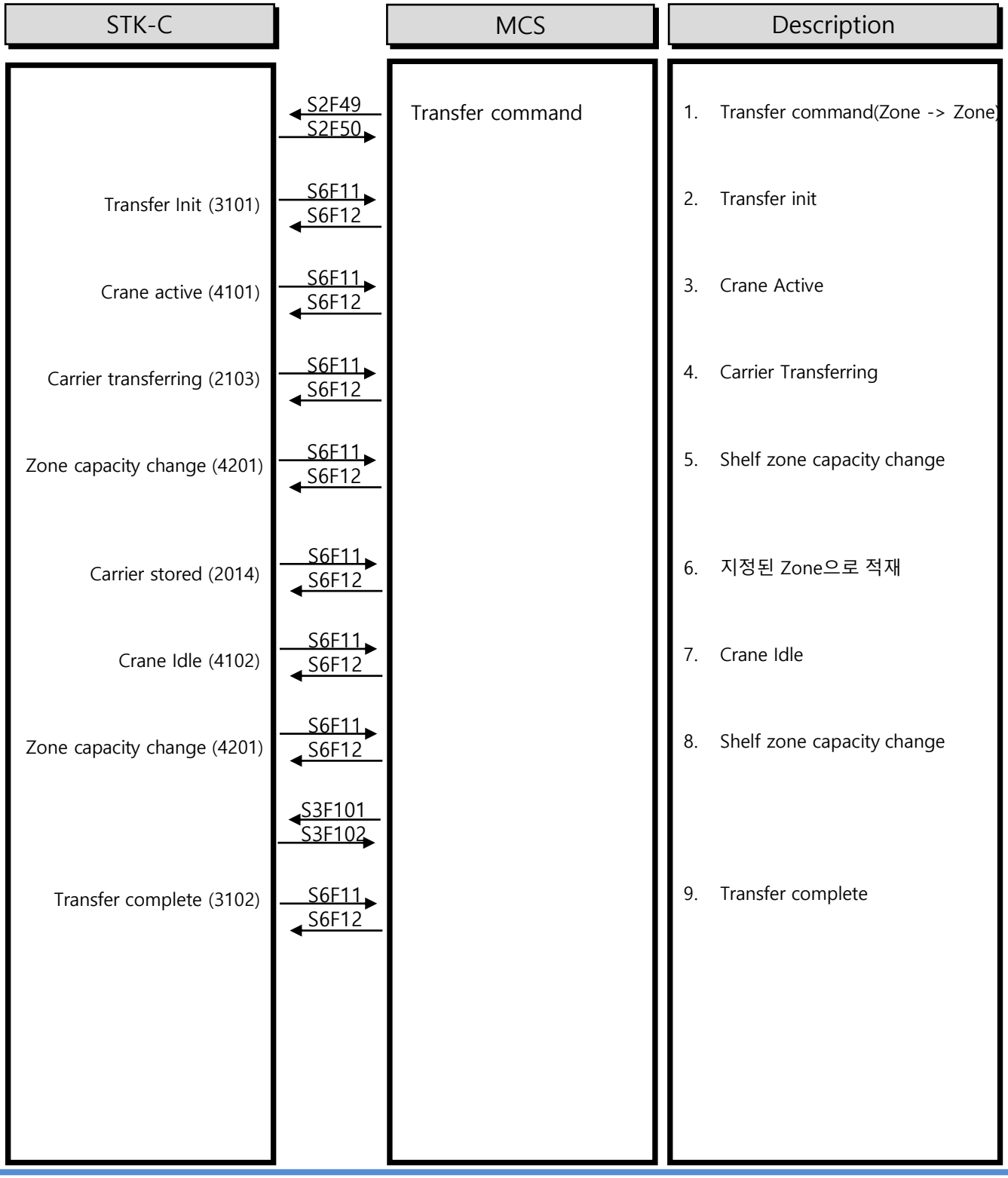


6.3.3 Input Port -> Output Port



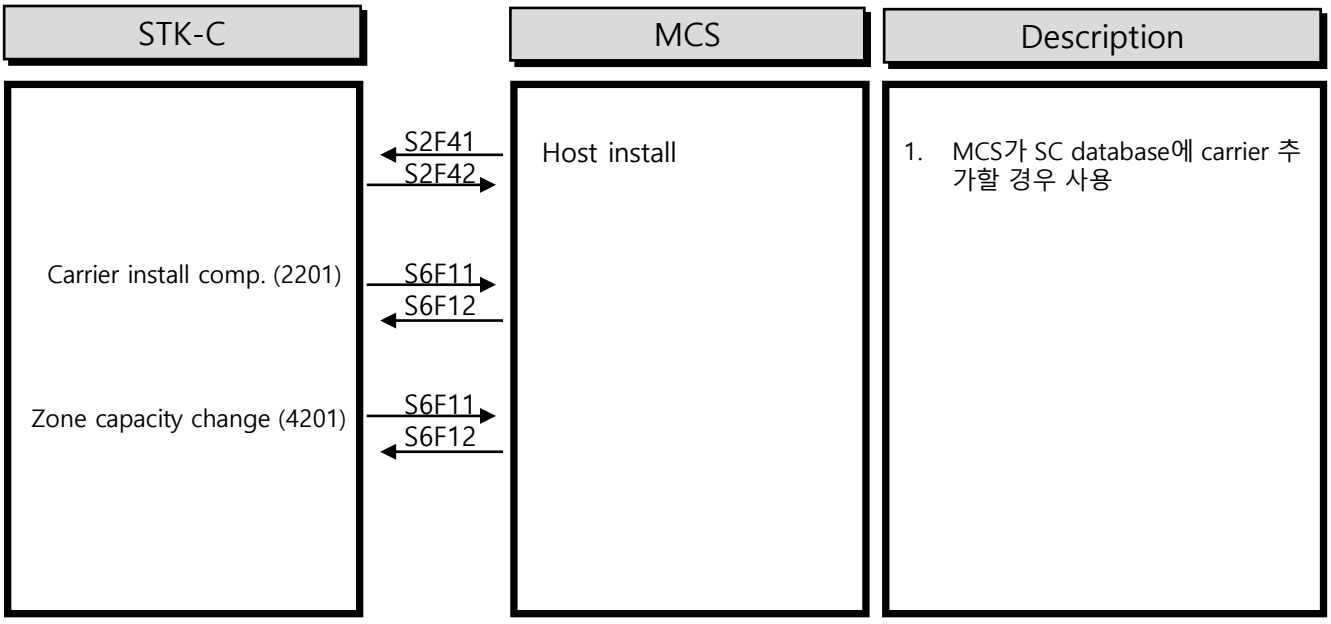
6.3 Scenario

6.3.4 Shelf -> Shelf

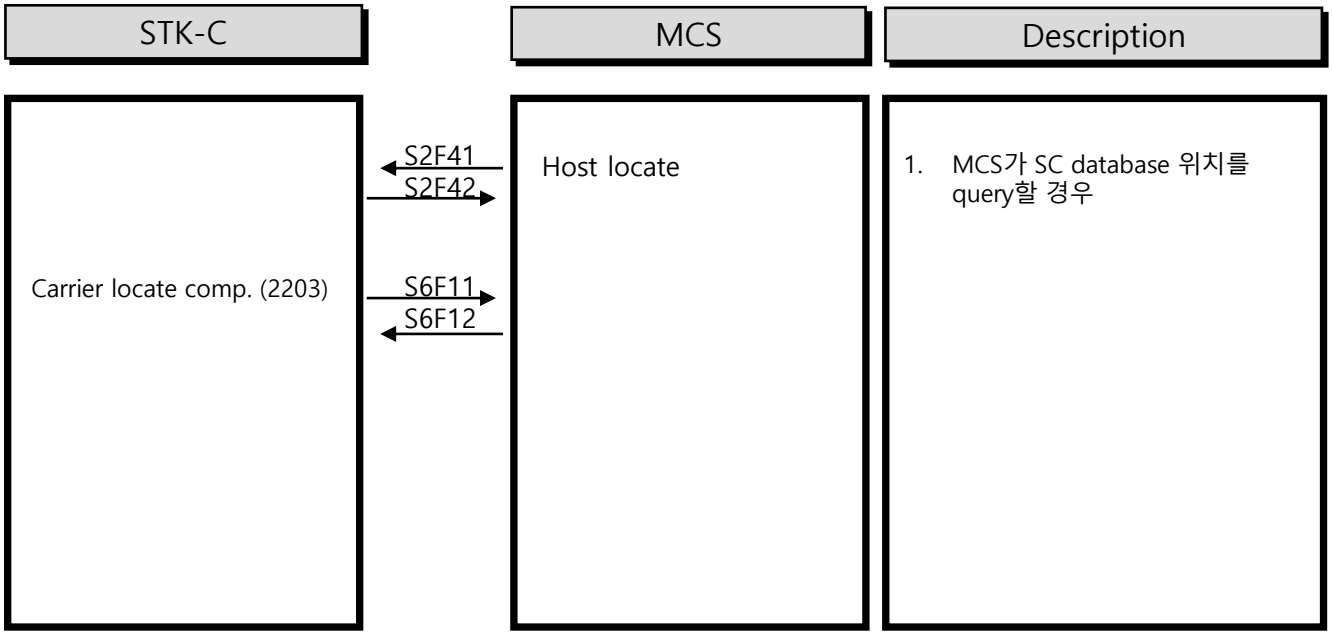


6.4 Data management

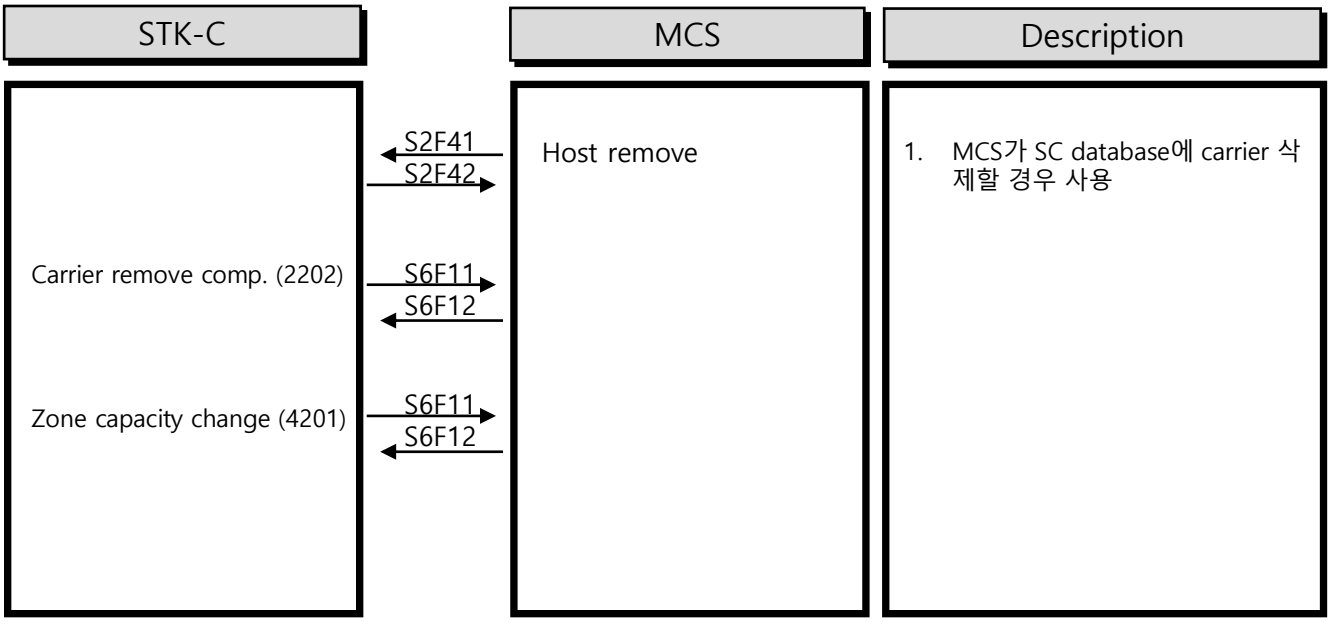
6.4.1 Install



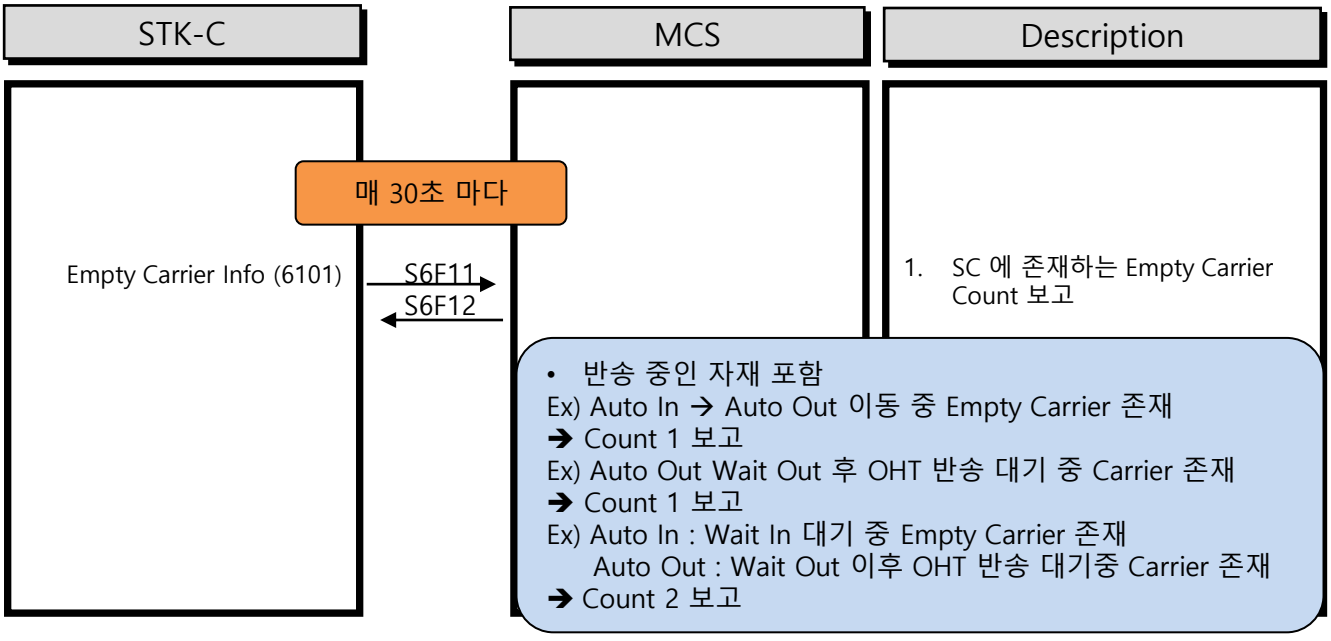
6.4.2 Location



6.4.3 Remove

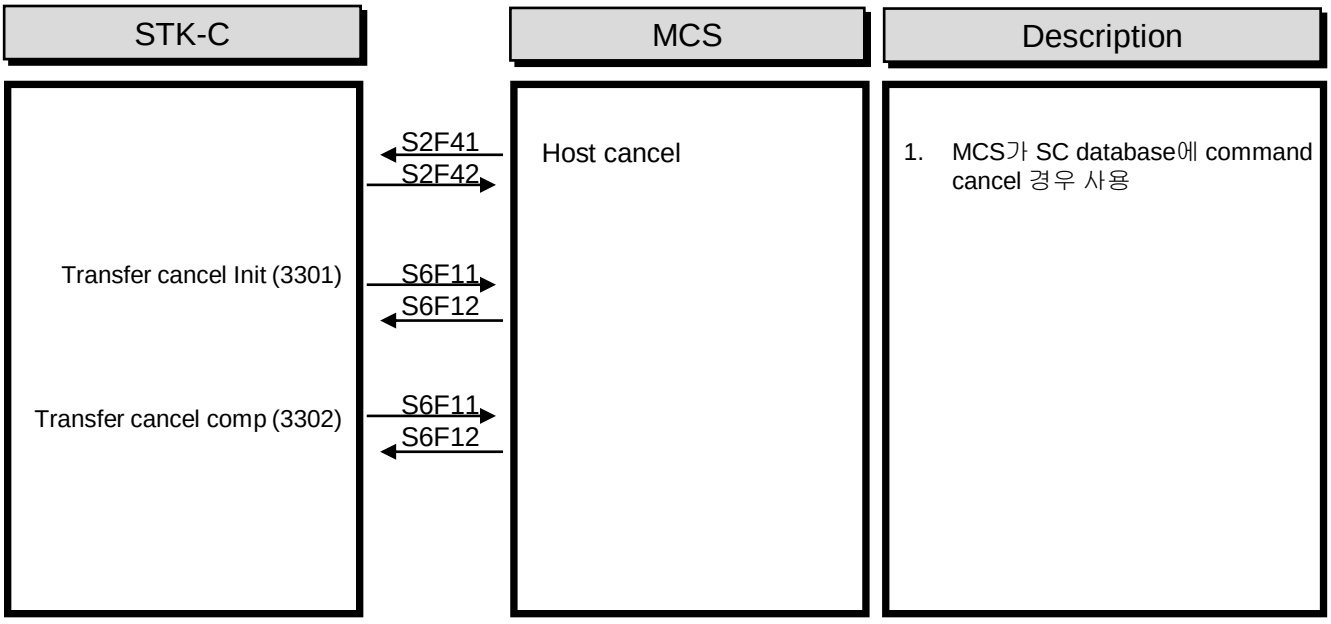


6.4.4 Empty Carrier Info

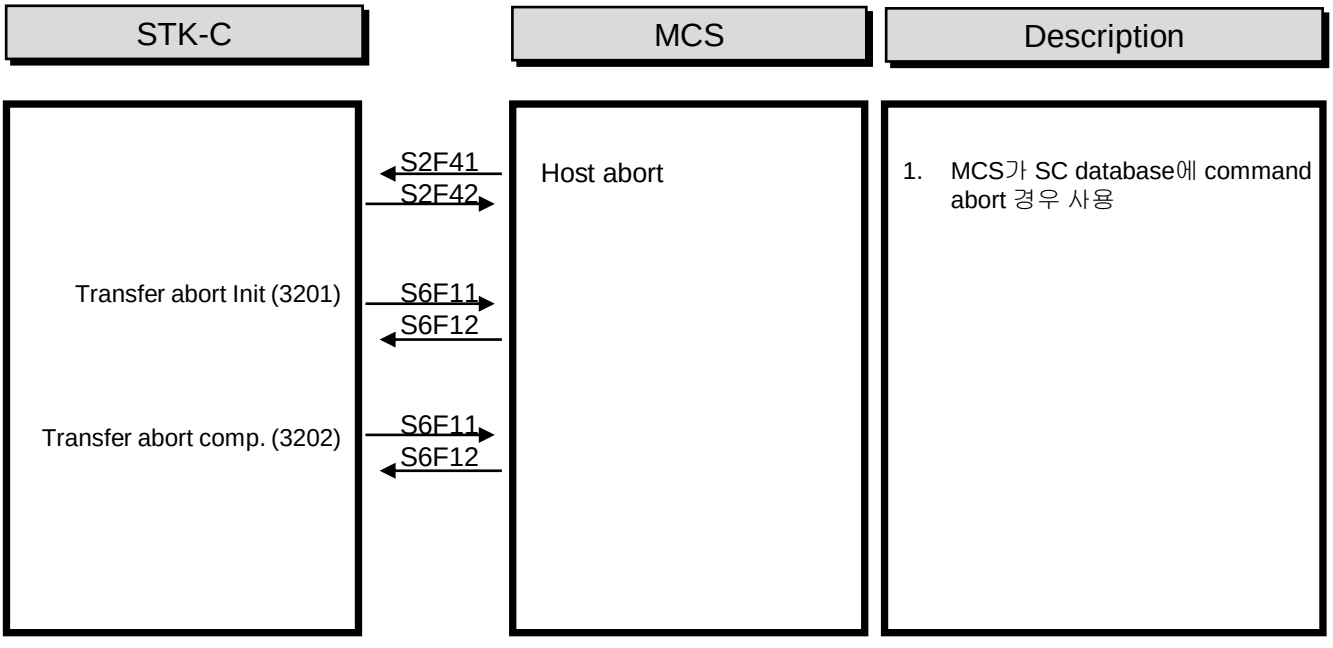


6.5 Remote command

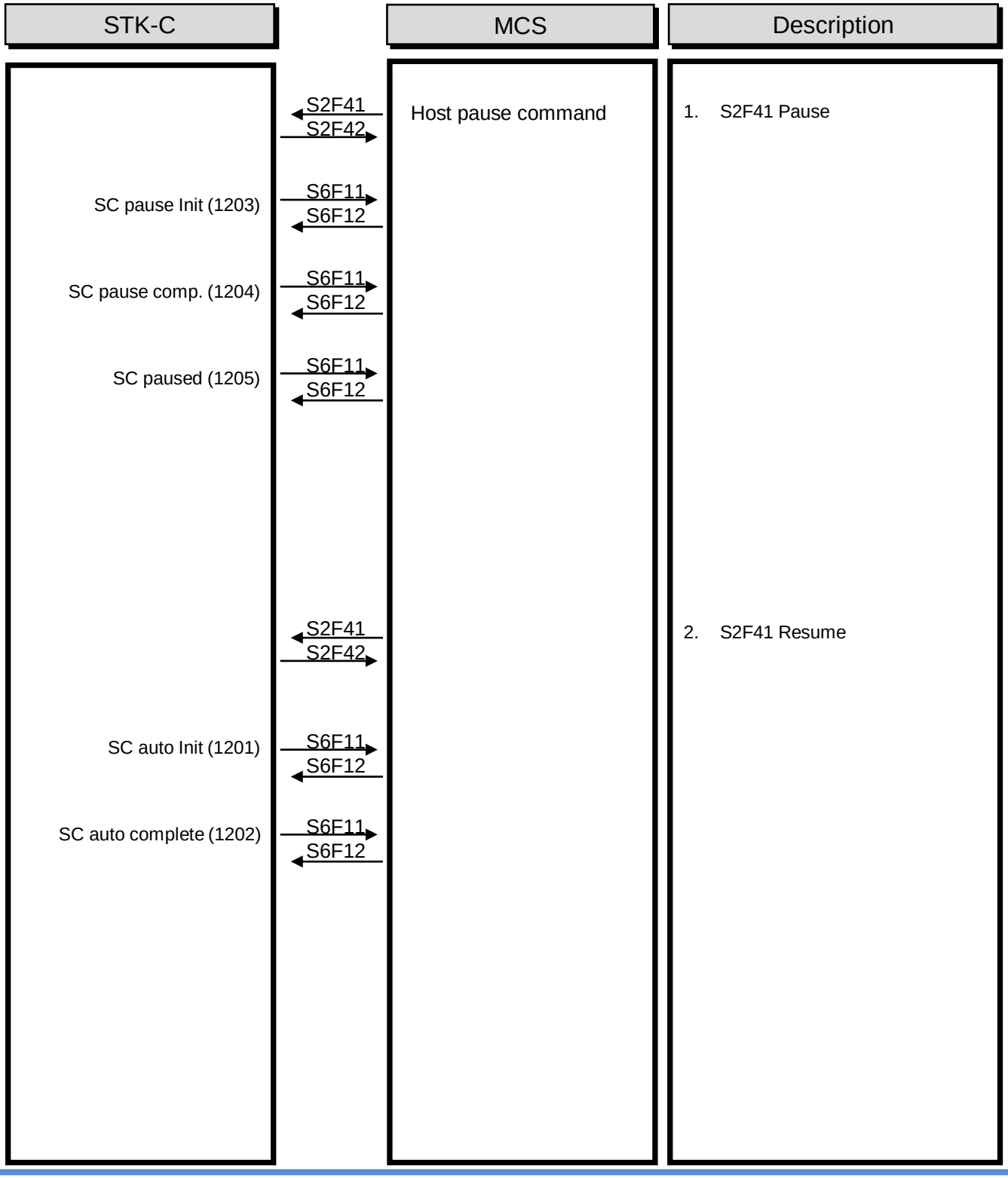
6.5.1 Cancel



6.5.2 Abort

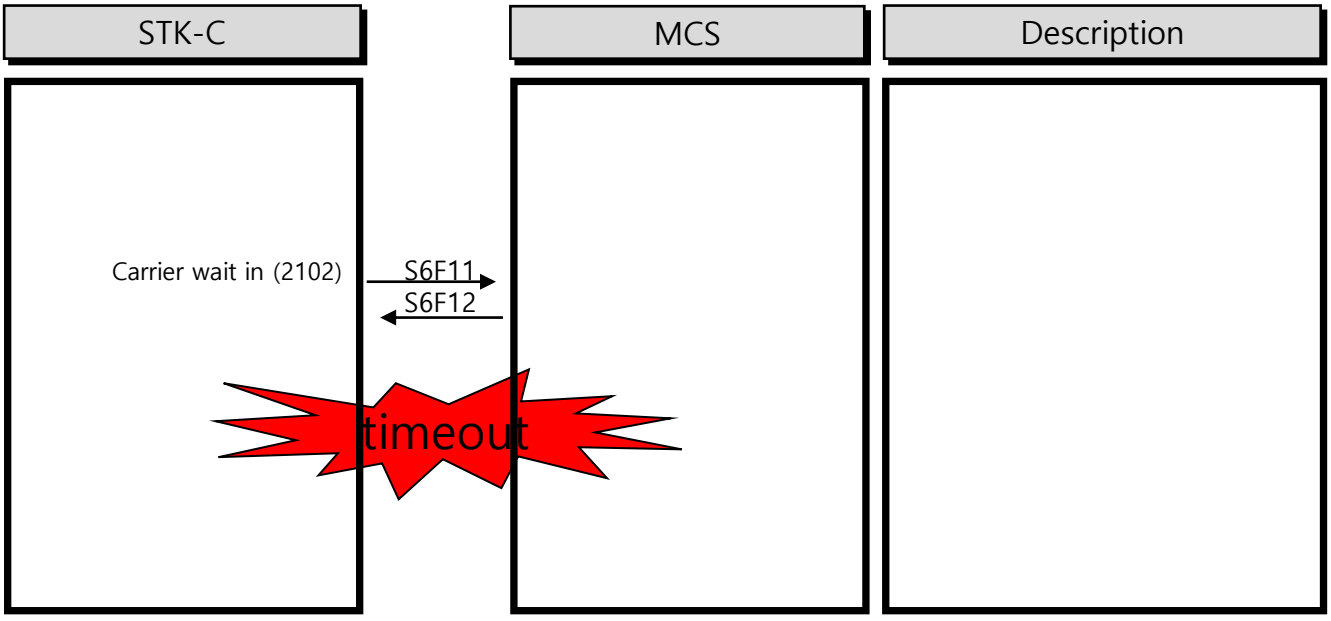


6.5.3 SC Pause/Resume



6.6 Abnormal scenario

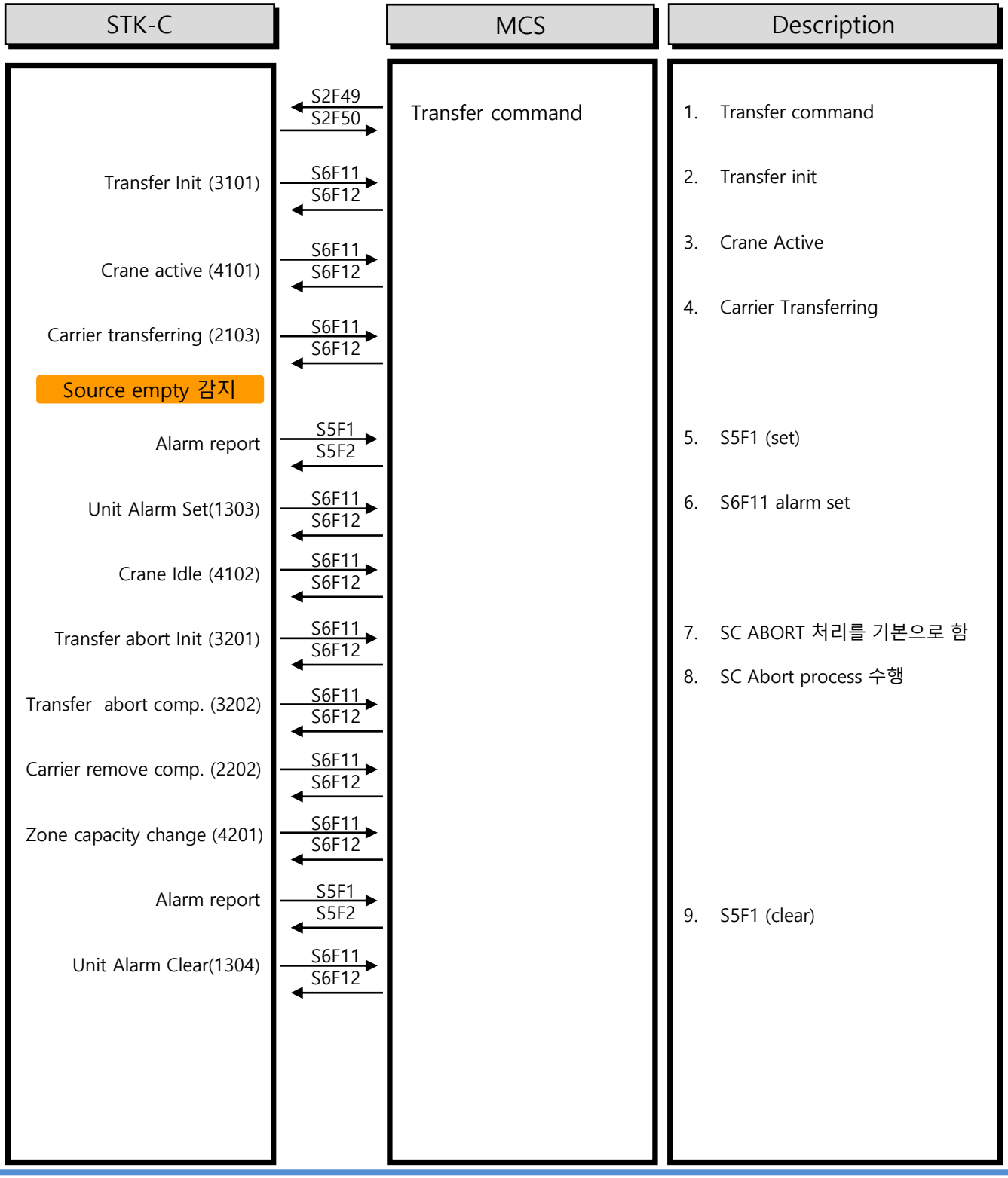
6.6.1 Host Timeout



*** SC 자체 처리함 - Operator(Command Type – Transfer)**
반송 명령을 받지 못할 경우 해당 Carrier 을 Shelf Stored 한다.

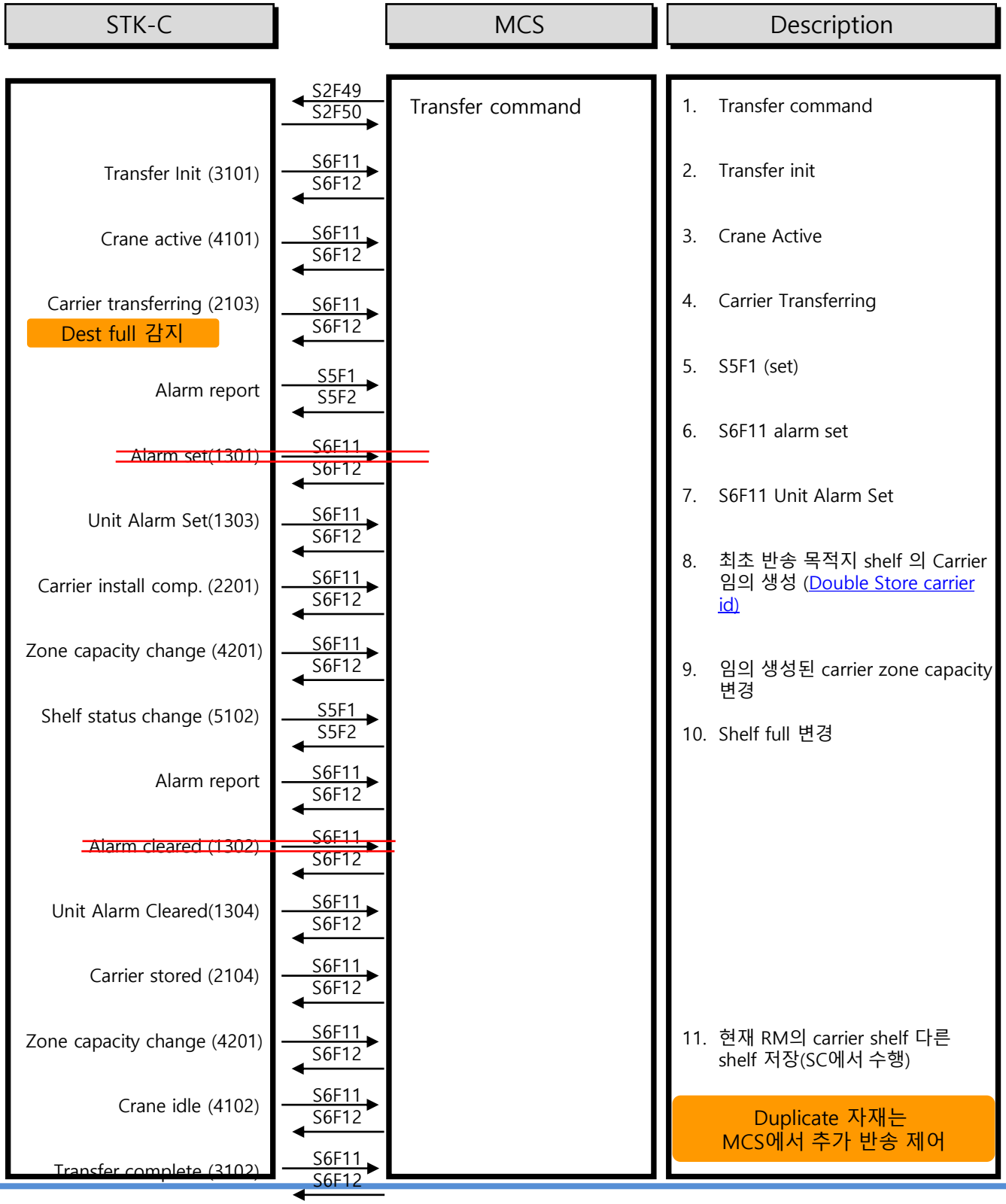
6.6 Abnormal scenario

6.6.2 Source Empty



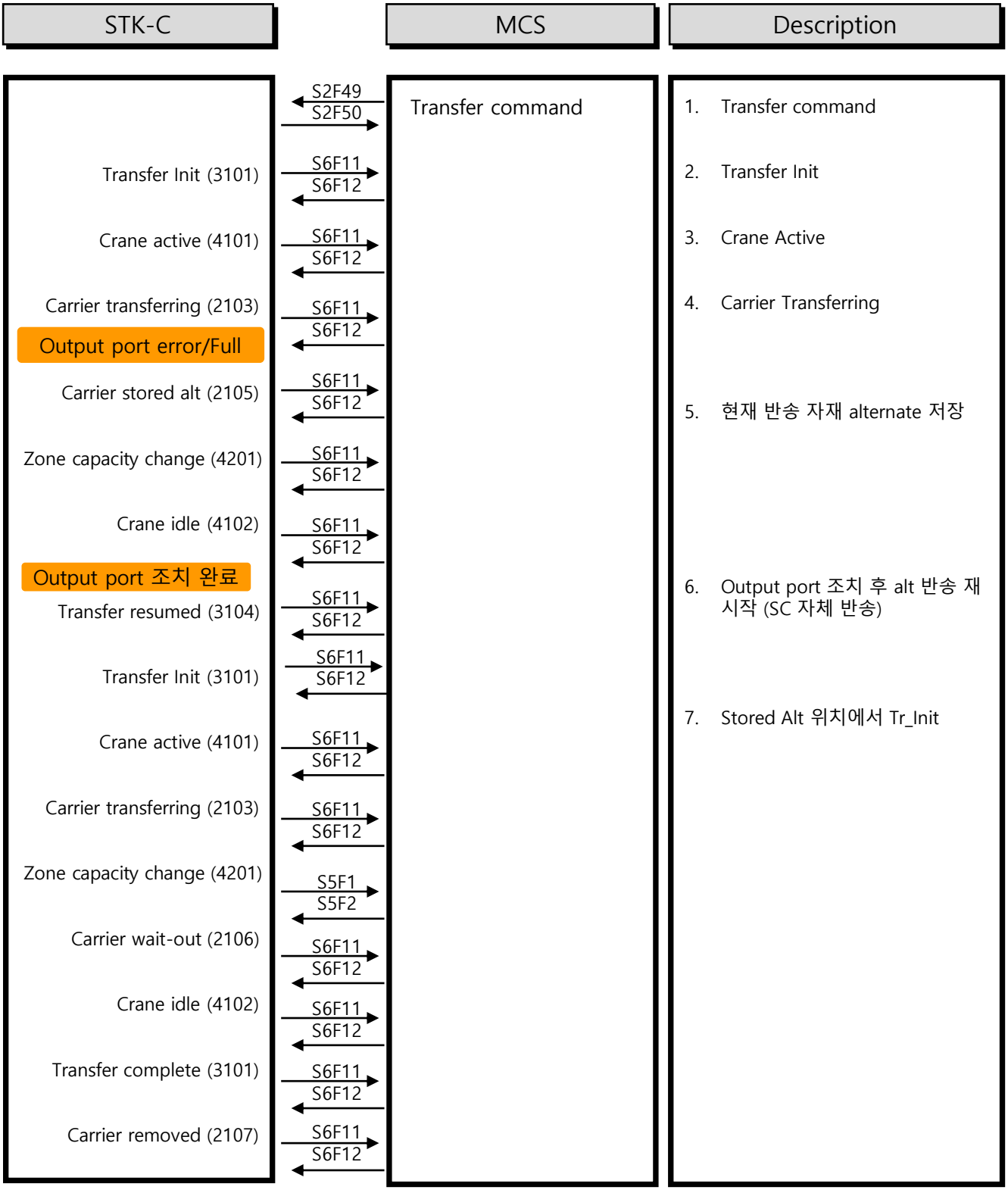
6.6 Abnormal scenario

6.6.3 Destination Full (Double Store)

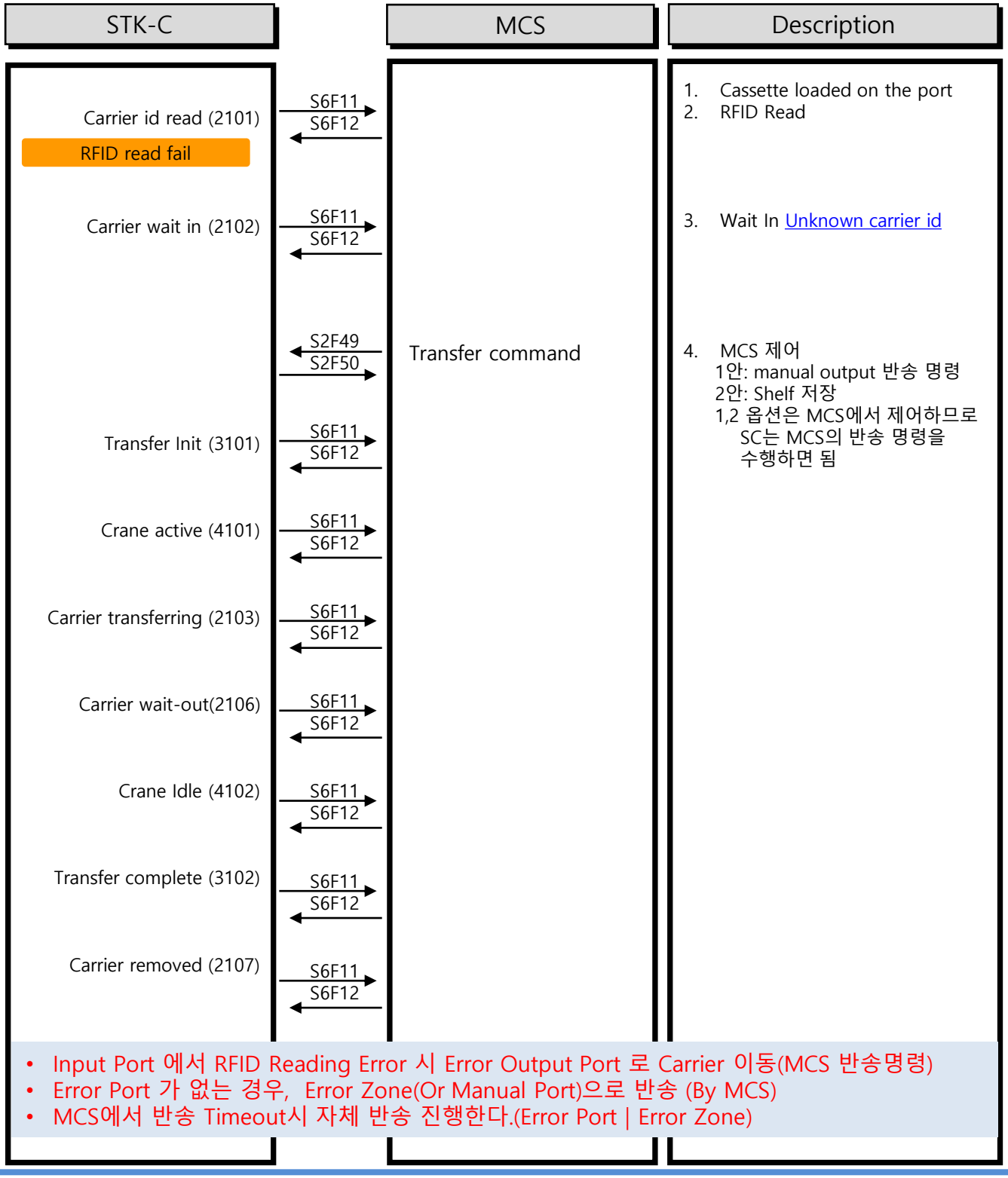


6.6 Abnormal scenario

6.6.4 Output Port is not available (반송중|반송전 output port down| OP Full)

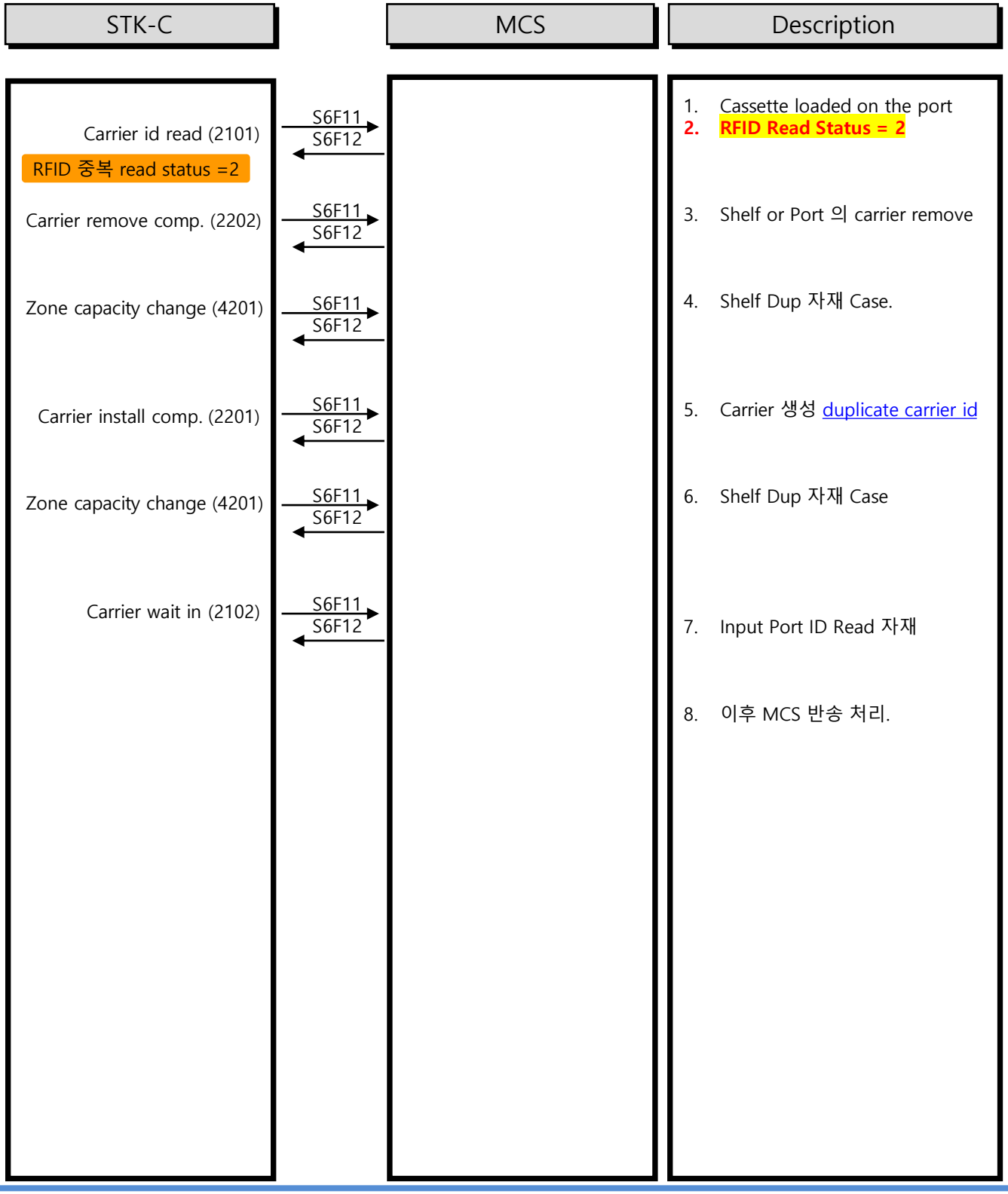


6.6.5 RFID Reading Error (Source Input Port)



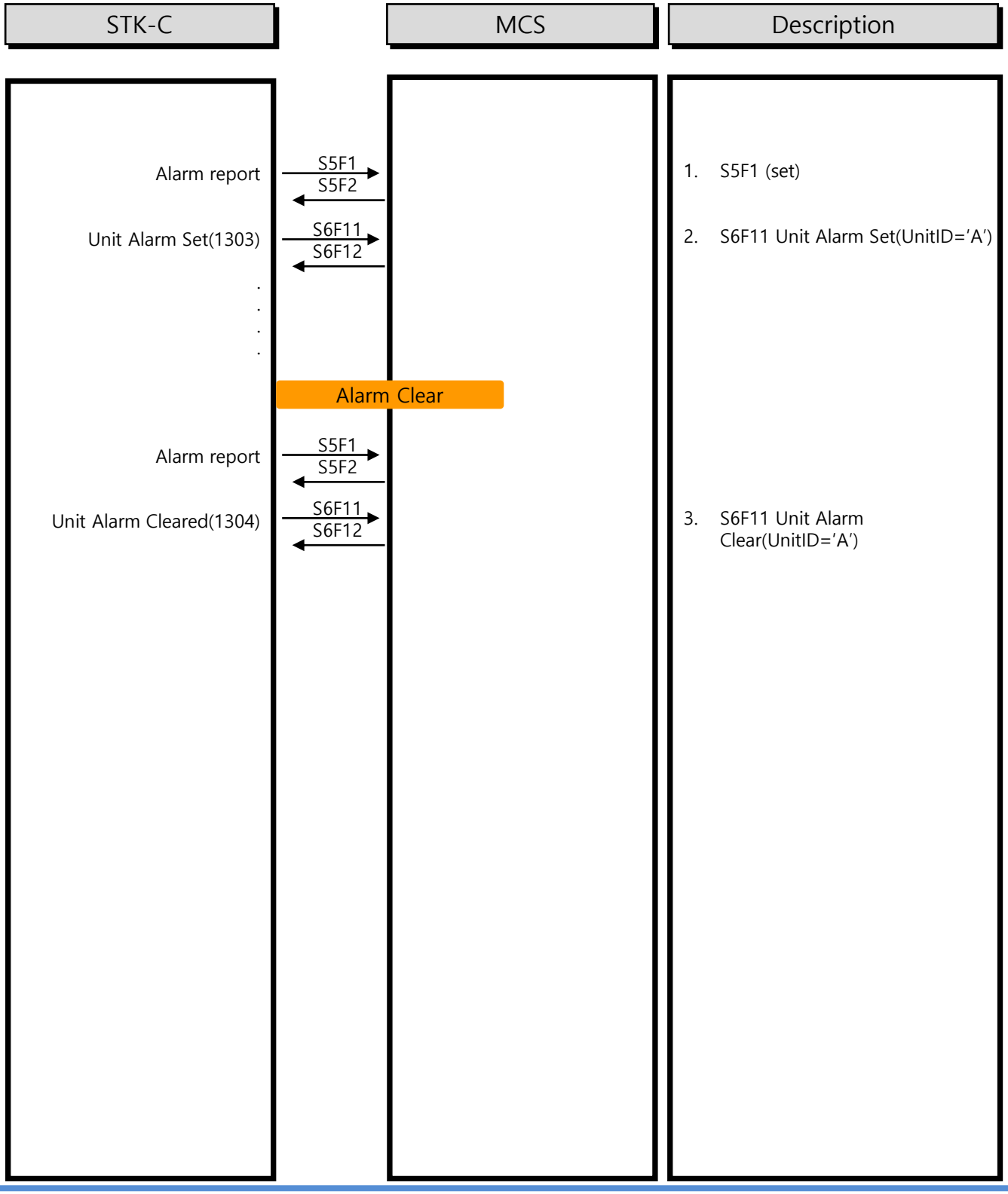
6.6 Abnormal scenario

6.6.6 RFID Duplicate Error (Input Port)

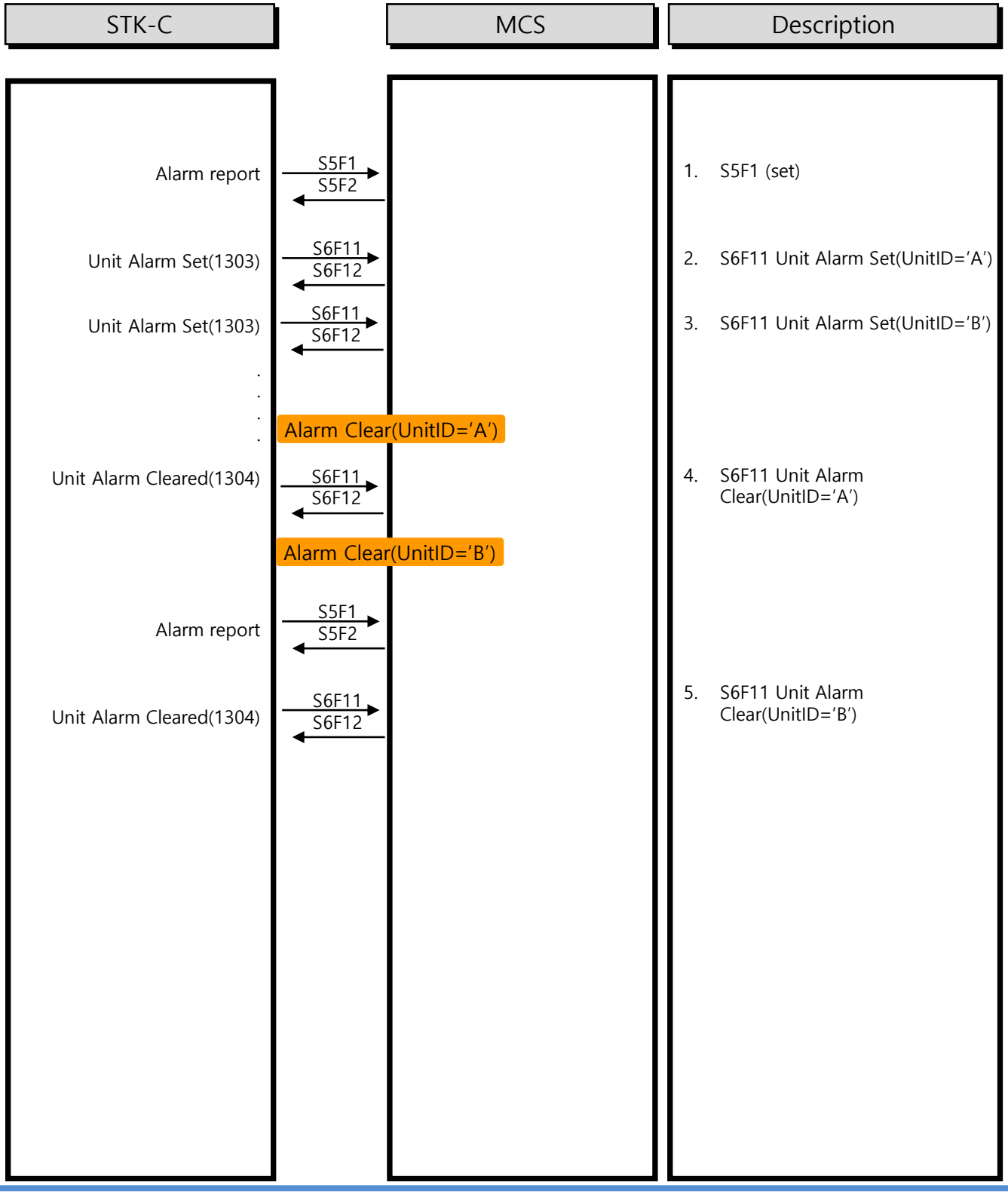


6.8 Alarm

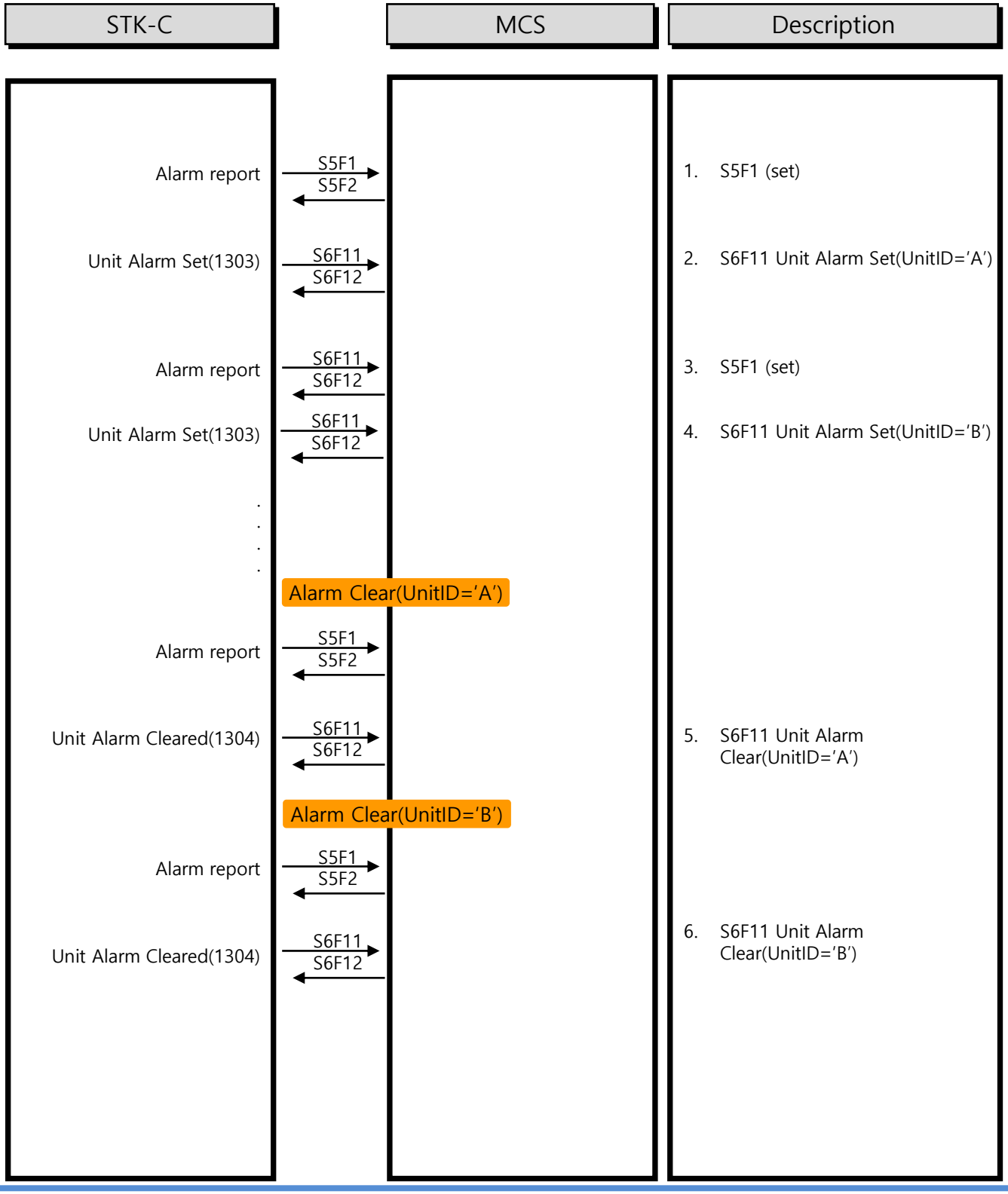
6.8.1 Alarm Set/Clear(One Unit Alarm)



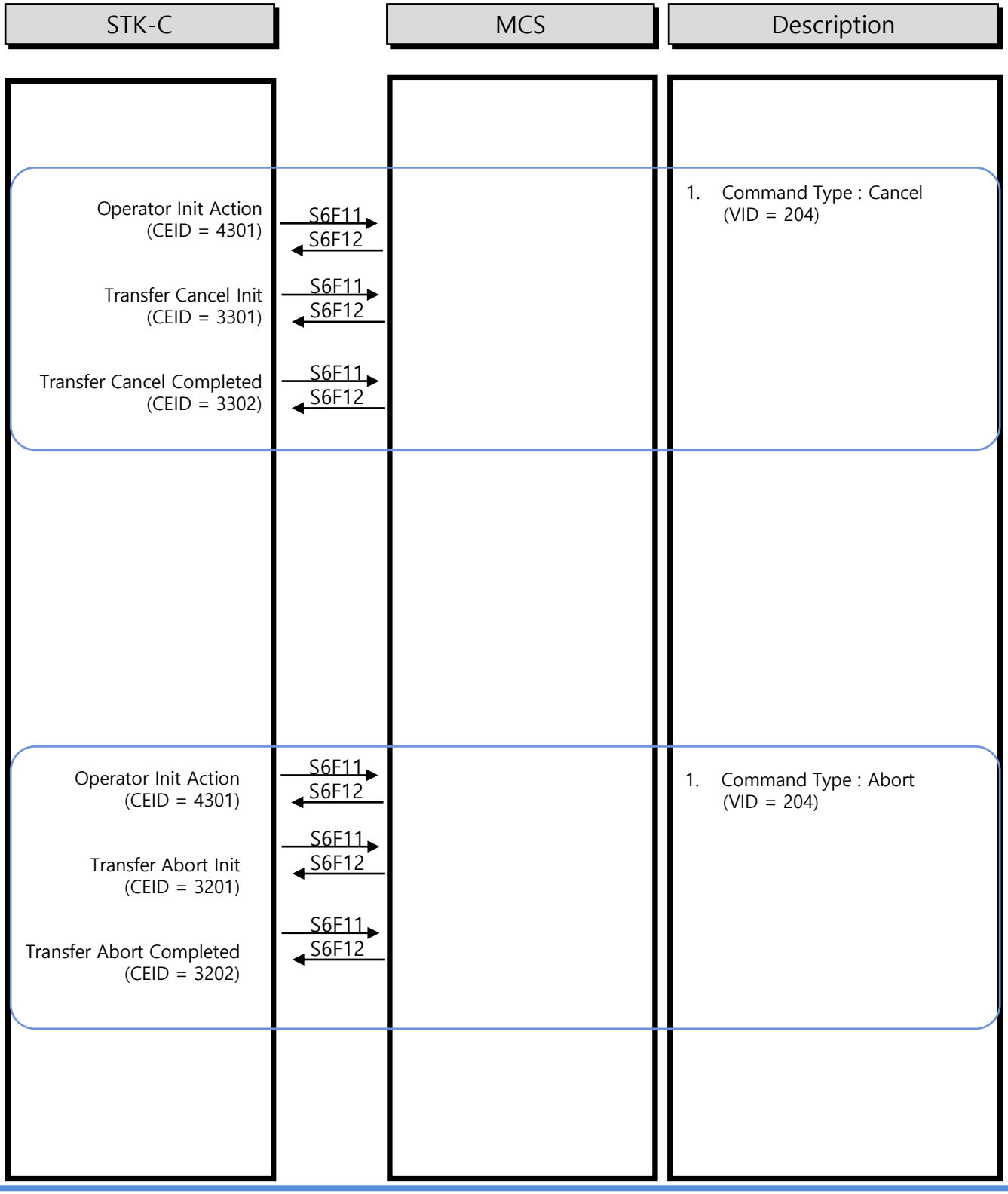
6.8.2 Alarm Set/Clear(Same alarms more than two units)



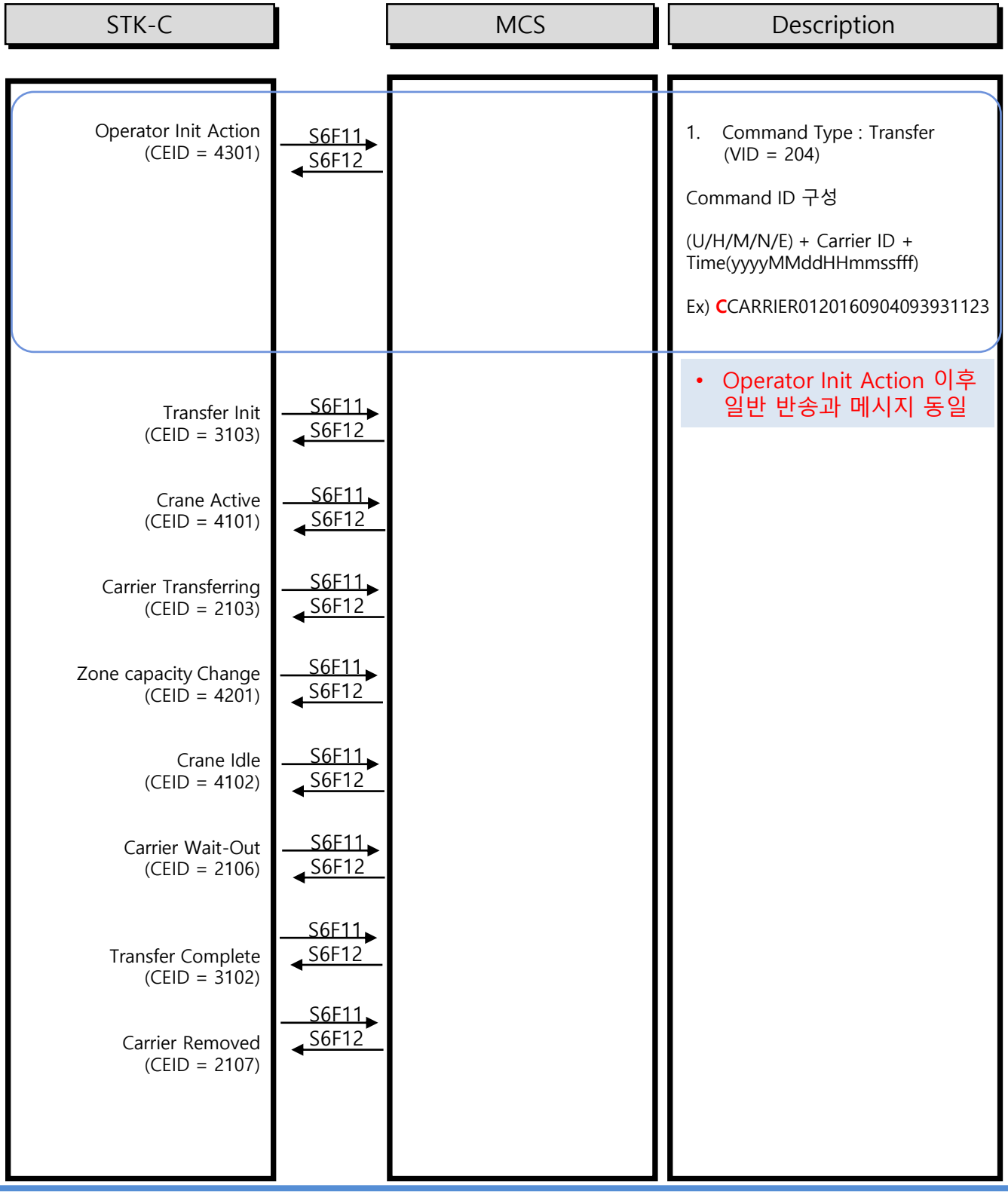
6.8.3 Alarm Set/Clear(Different alarms more than two units)



6.9.1 Operator(Command Type – Cancel, Abort) – SCS 매뉴얼 반송 취소



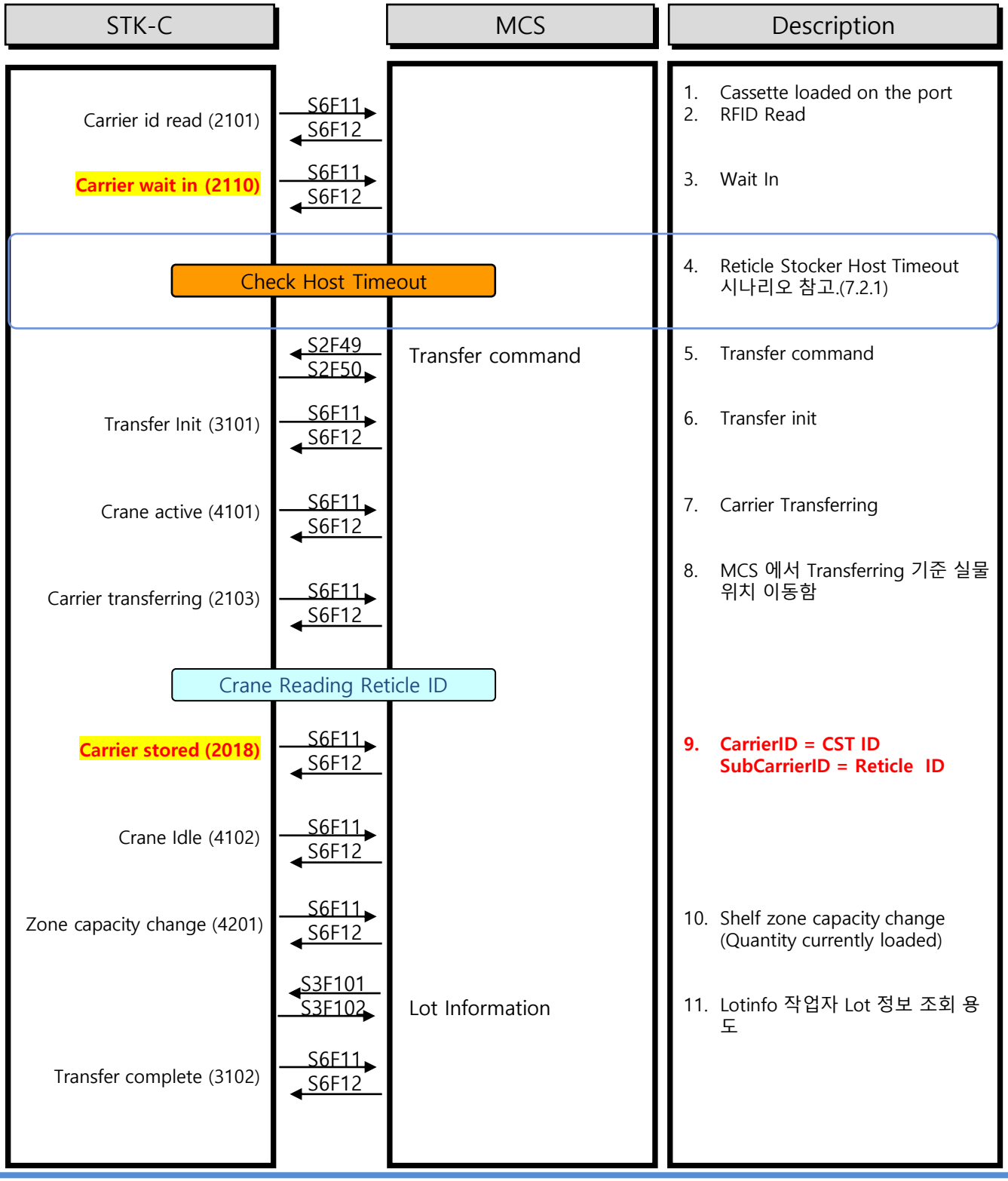
6.9.2 Operator(Command Type – Transfer) – SC 매뉴얼 반송



7.1 Reticle Stocker Transfer

*** Reticle Stocker**

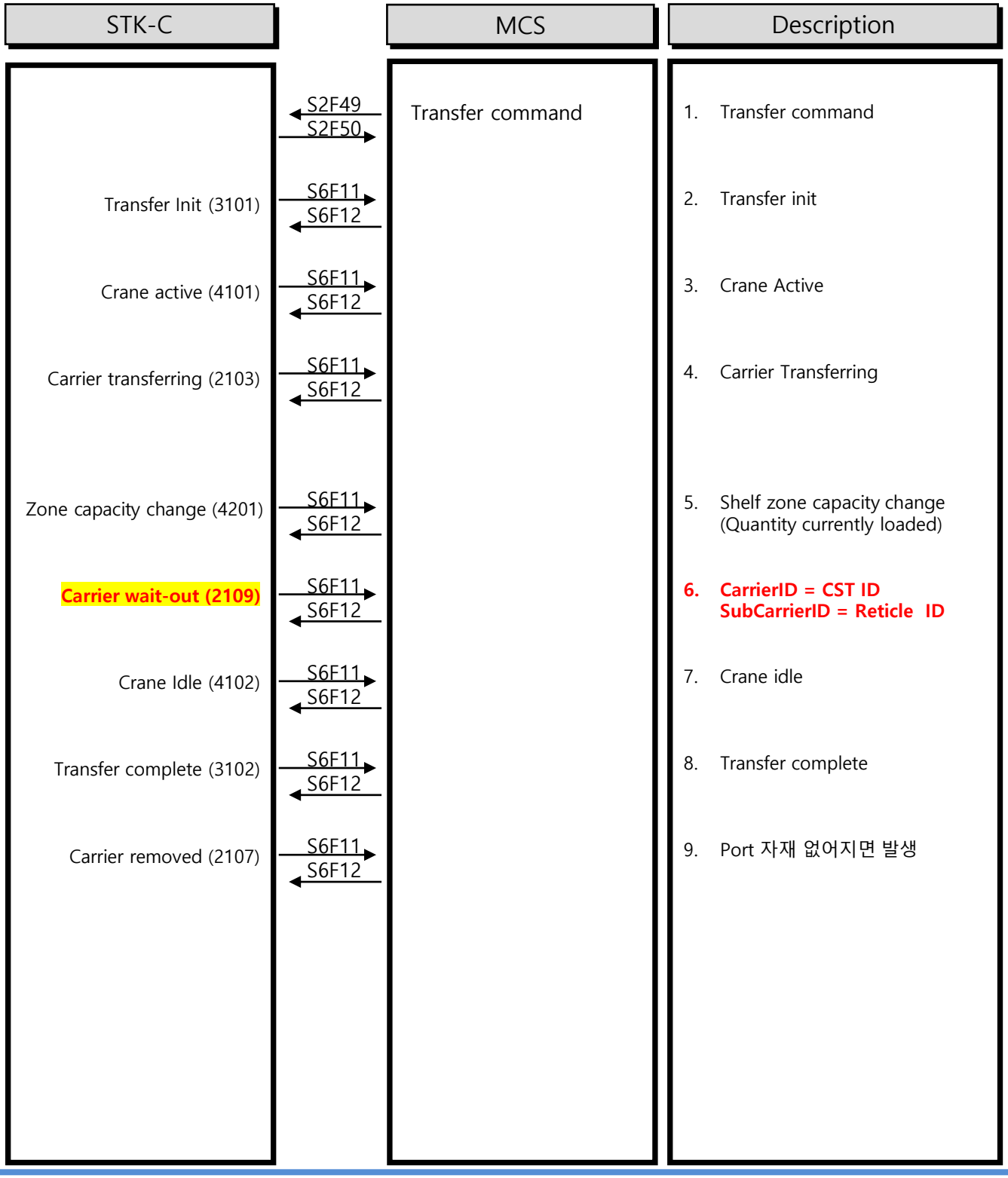
7.1.1 Input Port -> Shelf



7.1 Reticle Stocker Transfer

*** Reticle Stocker**

7.1.2 Shelf -> Output Port



* Reticle Stocker

7.1.3 Input Port -> Output Port

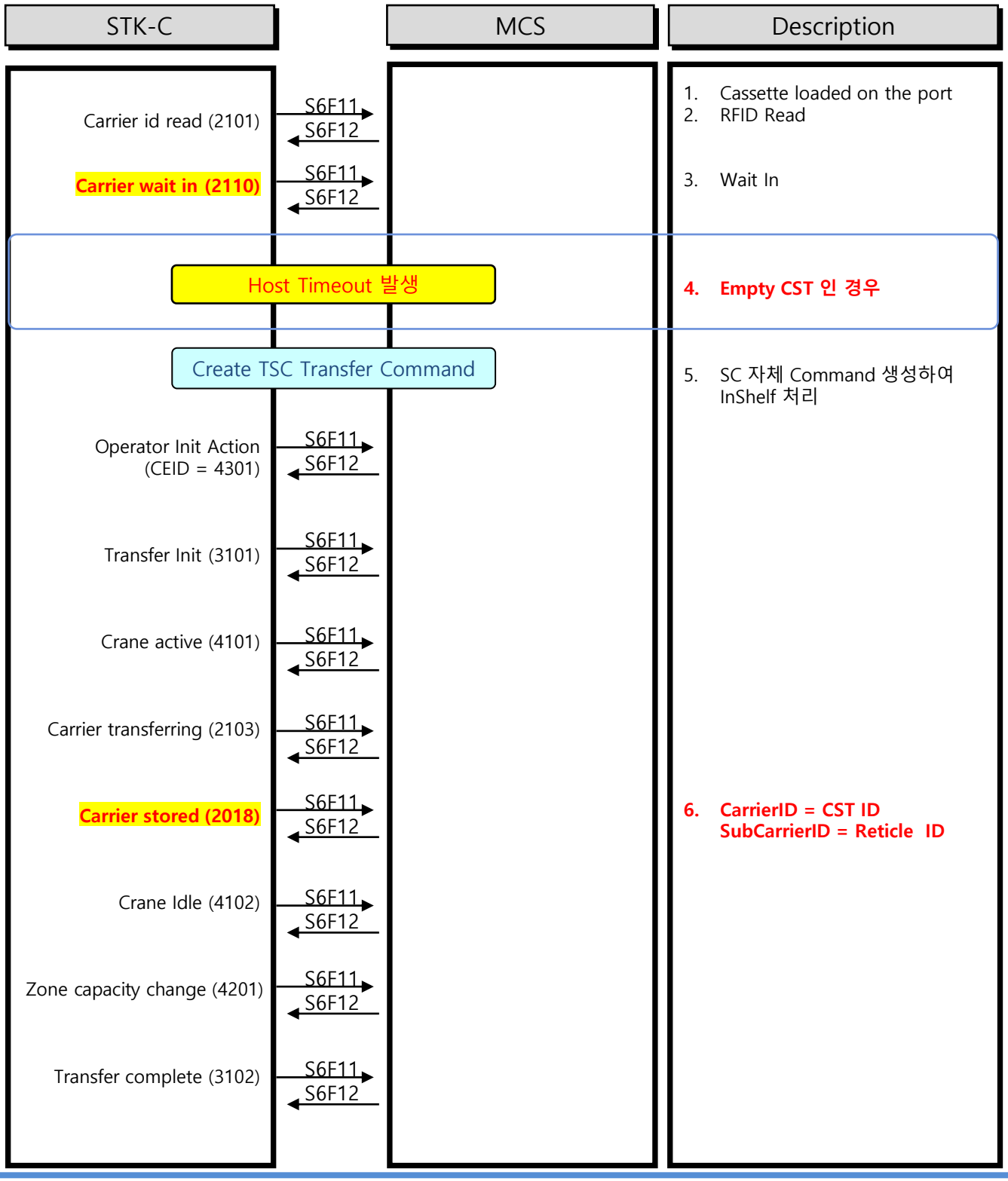
Input to Output 반송은 존재하지 않음.

MCS 에서 반송 차단

반송 차단 되어 Timeout 발생 할 경우 Host Timeout 시나리오 진행

*** Reticle Stocker**

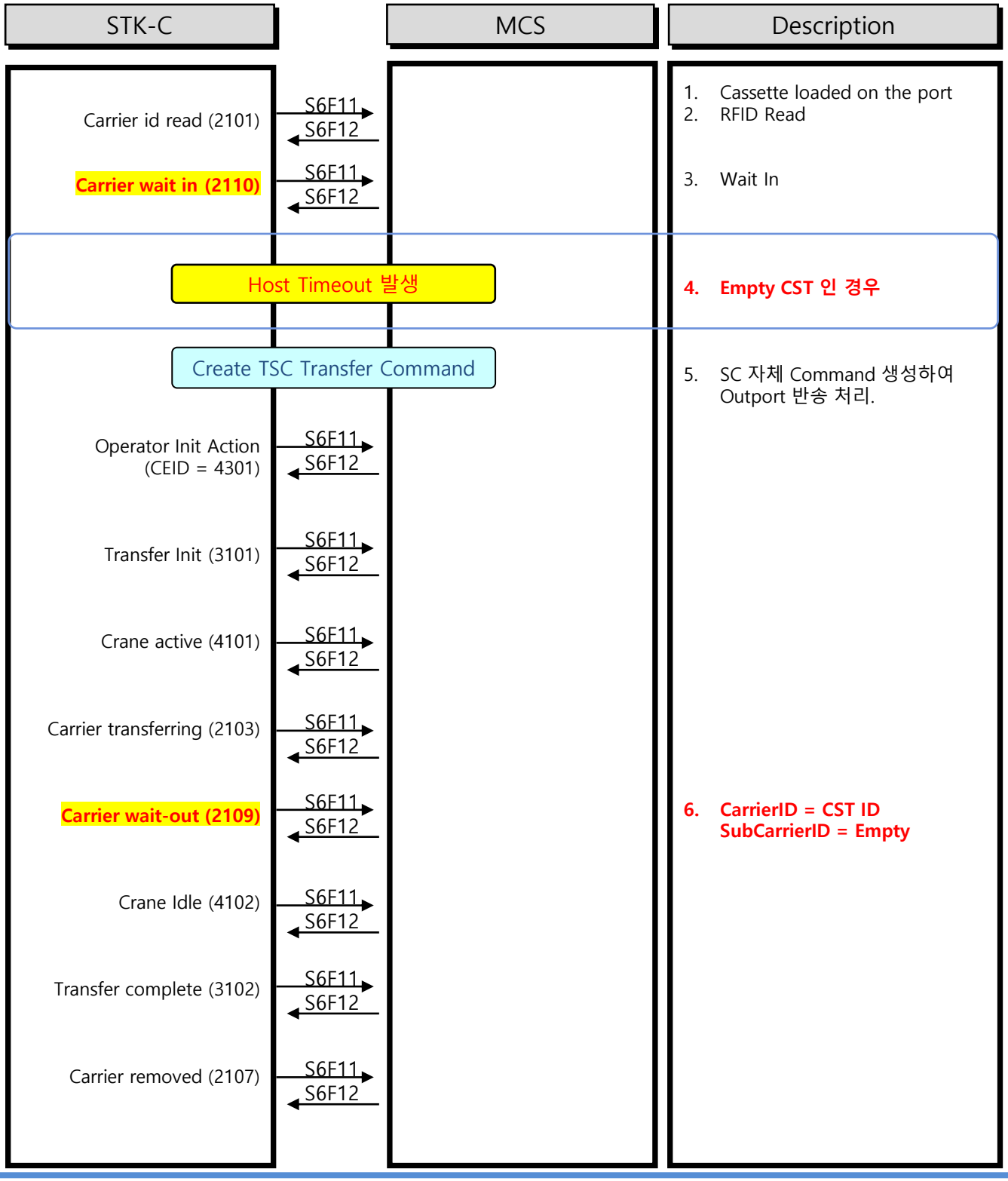
7.2.1 Host Timeout(Occupied CST) – Include Reticle



7.1 Reticle Stocker Transfer

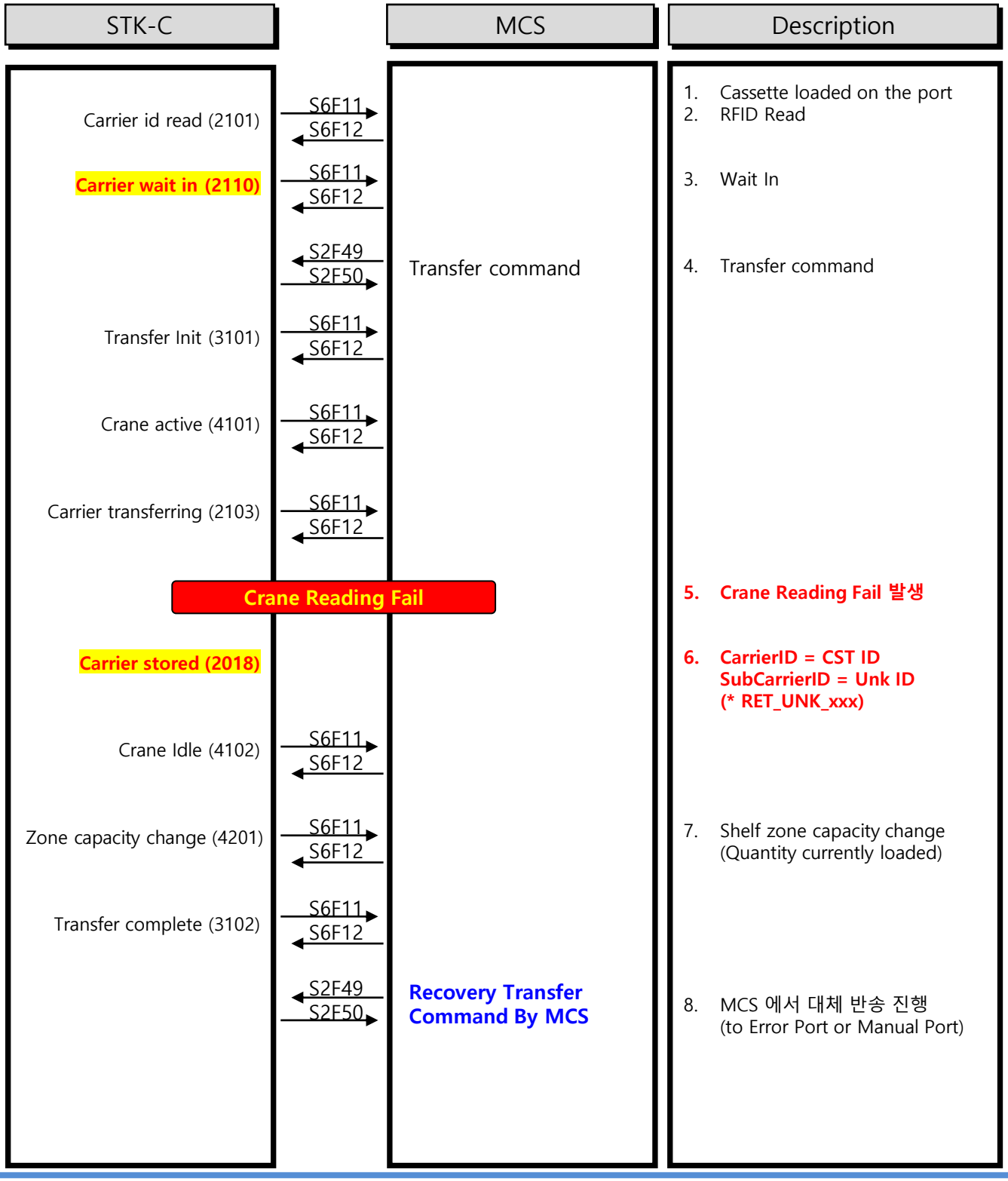
*** Reticle Stocker**

7.2.2 Host Timeout(Empty CST)



*** Reticle Stocker**

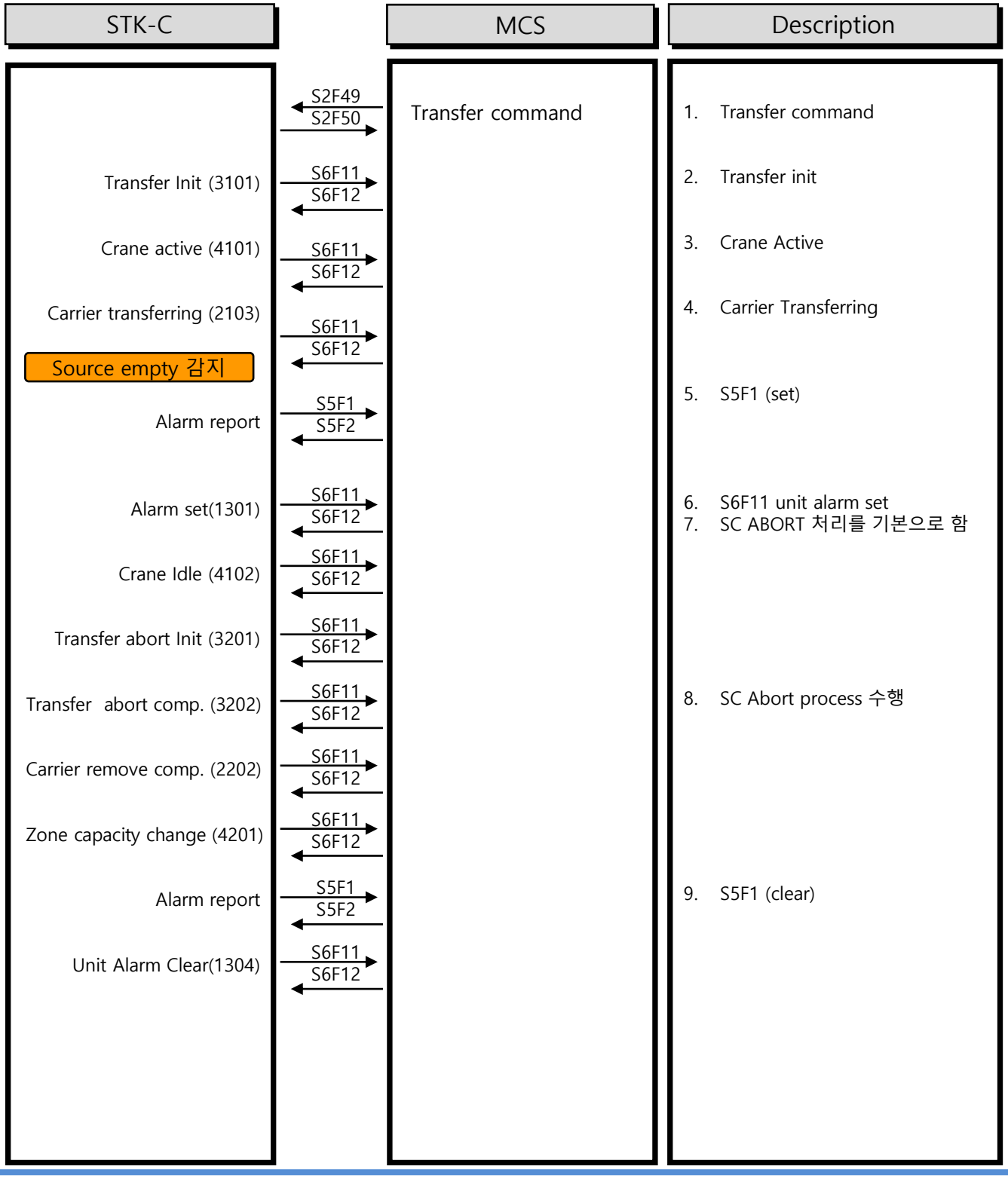
7.2.3 RFID Reading Error (In Crane)



7.1 Reticle Stocker Transfer

*** Reticle Stocker**

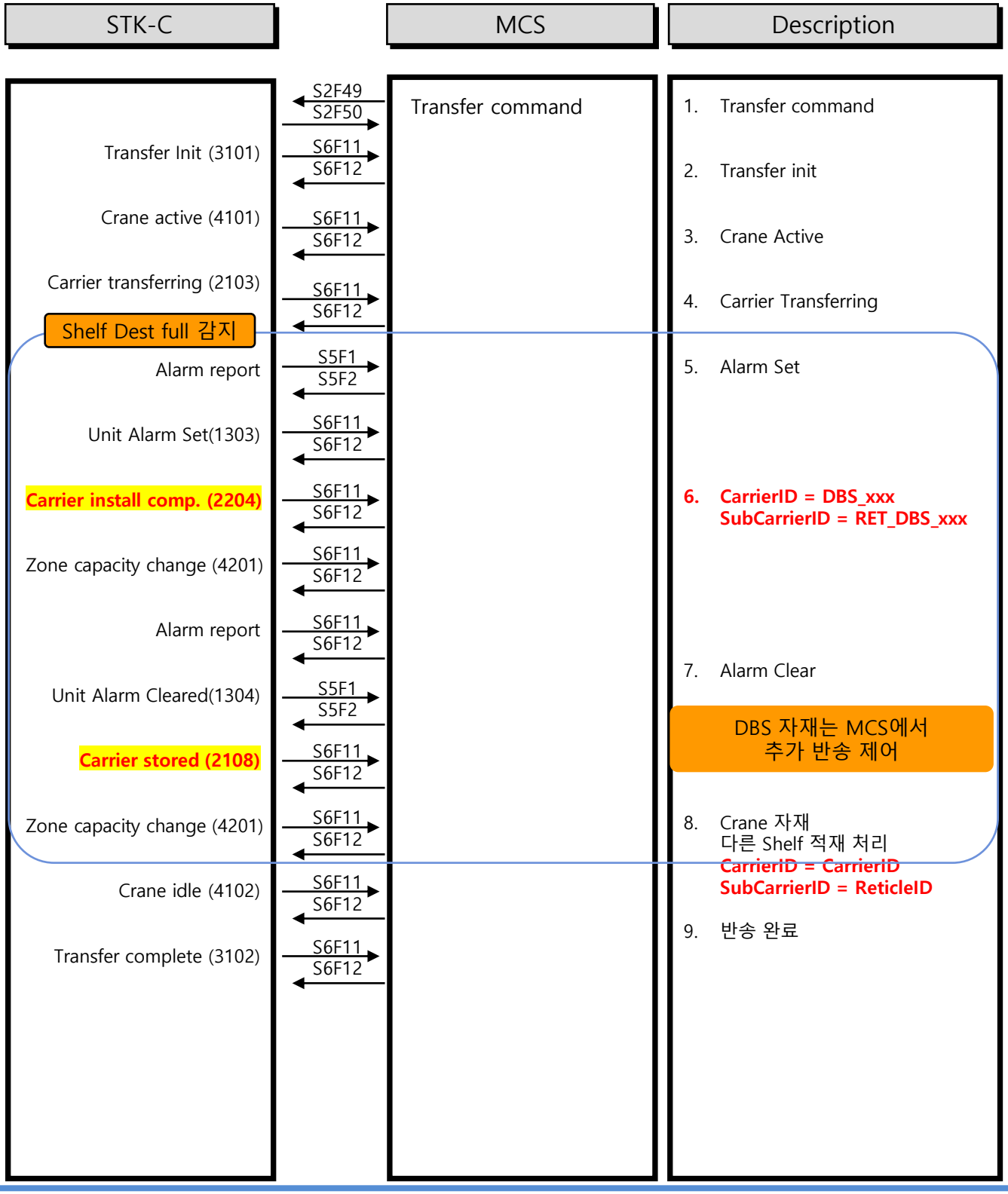
7.2.4 Source Empty(Normal Stocker 동일)



7.1 Reticle Stocker Transfer

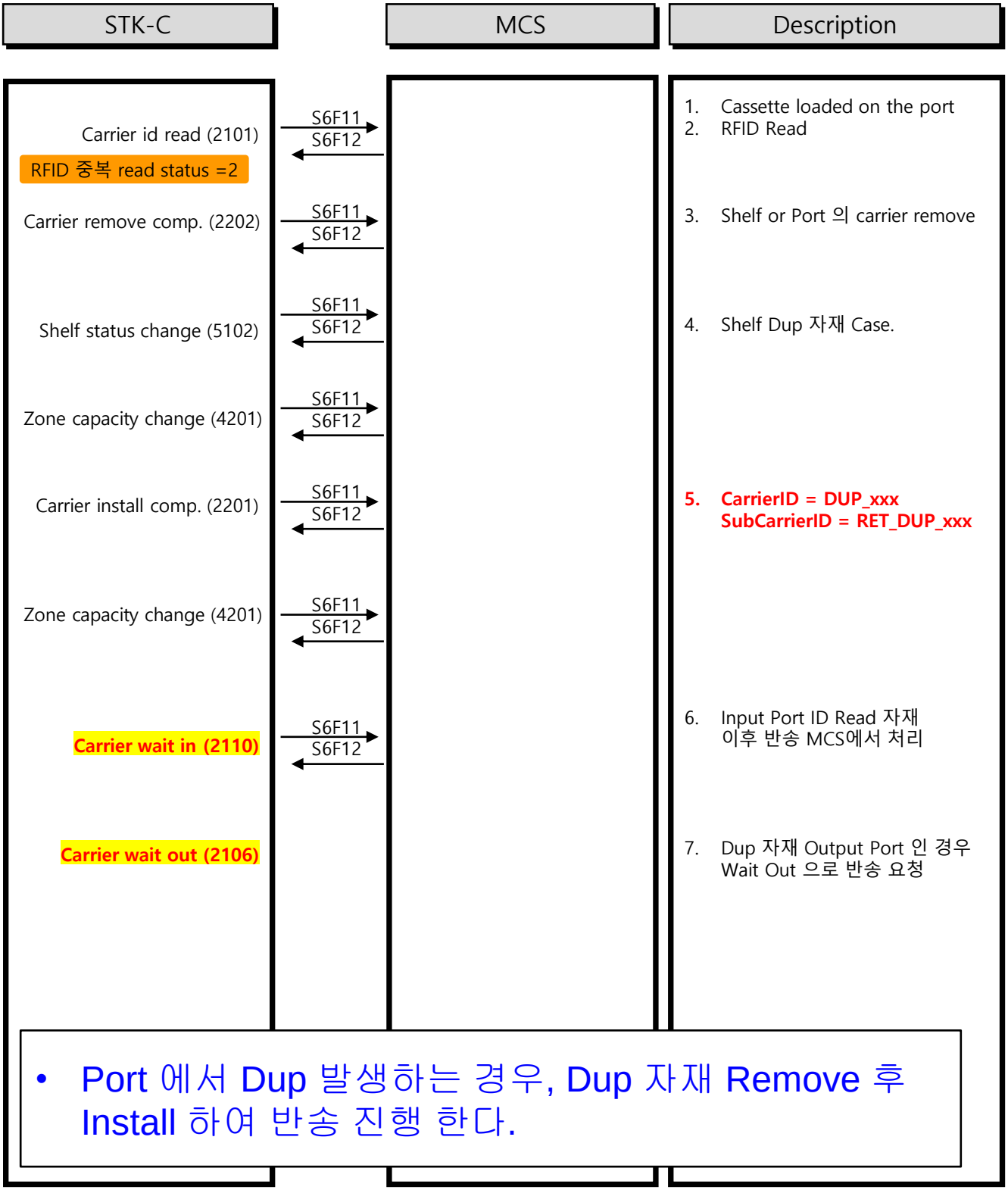
*** Reticle Stocker**

7.2.5 Destination Full (Double Store)



*** Reticle Stocker**

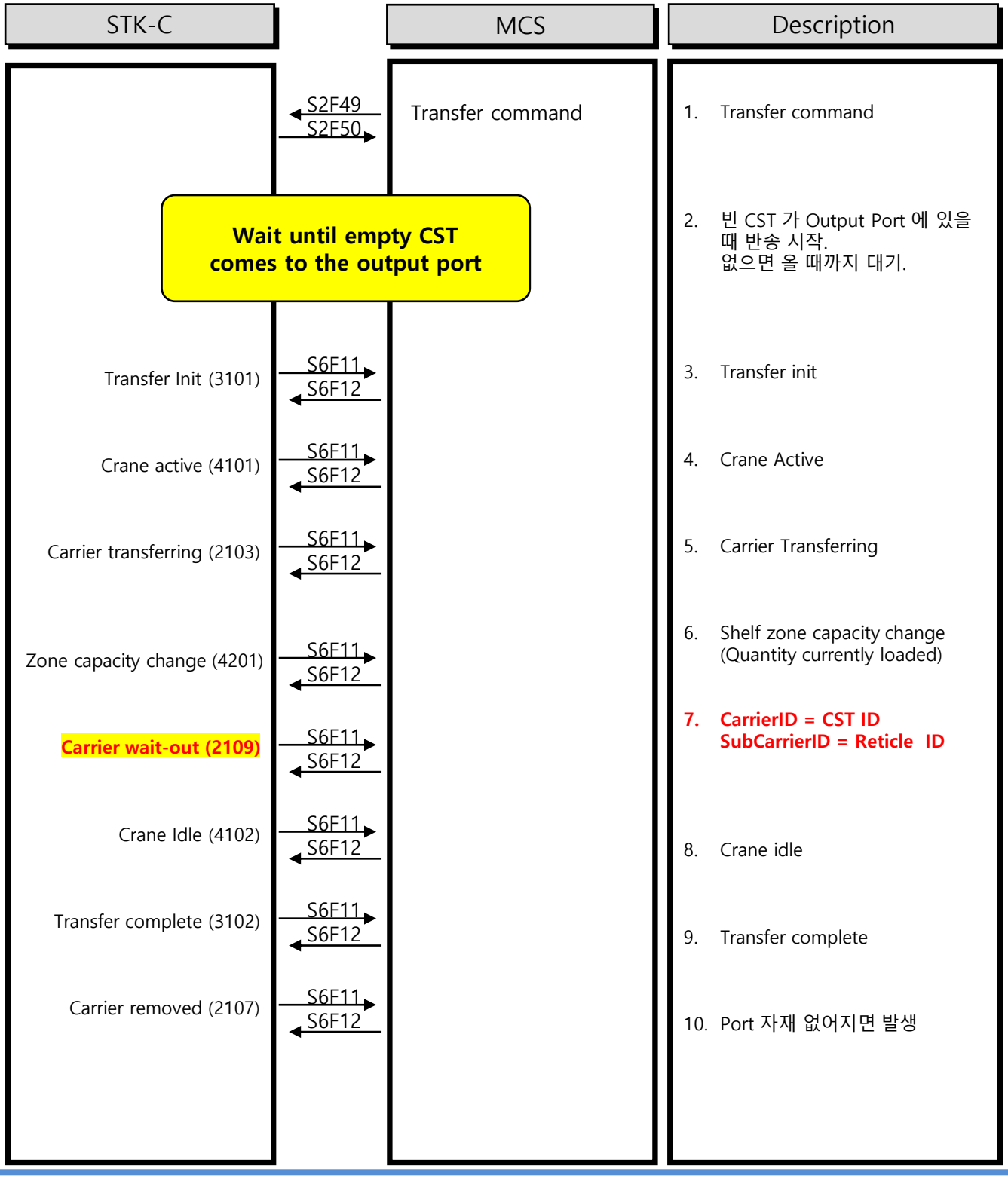
7.2.6 Duplicate



- Port 에서 Dup 발생하는 경우, Dup 자재 Remove 후 Install 하여 반송 진행 한다.

*** Reticle Stocker**

7.2.7 Shelf -> Output Port(**Output Port not exist Empty CST**)



*** Reticle Stocker**

7.2.8 Output Port – Empty CST Transfer

