

Tutorial on Message Sequence Charts (MSC'96)

Ekkart Rudolph

Technical University of Munich
Institute for Informatics
Arcisstr.21
D-80290 München
Germany
eMail: rudolph@informatik.tu-muenchen.de

Jens Grabowski

University of Lübeck
Institute for Telematics
Ratzeburger Allee 160
D-23538 Lübeck
Germany
eMail: jens@itm.mu-luebeck.de

Peter Graubmann

Siemens AG
ZFE T SE
Otto-Hahn-Ring
D-81739 München
Germany
eMail: gr@zfe.siemens.de

History

- **1492:**
Christopher Columbus discovers America
- **SDL-Forum Lisbon, October 1989:**
First suggestion for MSC standardization
- **CCITT-Meeting in Helsinki, June 1990:**
MSC standardization decided
- **CCITT-Meeting in Recife, December 1991:**
Form of Z.120 adjusted to Z.100
Approval within study group
- **CCITT-Meeting in Geneva, May 1992:**
Closing session of the study period:
Approval of recommendation Z.120
- **ITU-TS Meeting in Geneva, November 1993:**
Revised version of Z.120 (minor corrections)
- **ITU-TS Meeting in Geneva, October 1994:**
Formal dynamic semantics definition as Annex B to Z.120:
Message Sequence Charts Algebraic Semantics
- **ITU-TS Meeting in Geneva, September 1995:**
Formal static semantics definition as Annex C to Z.120:
Static Semantics of Message Sequence Charts
- **ITU-TS Meeting in Geneva, April 1996:**
Closing session of the study period:
Approval of new recommendation Z.120

MSC'96

Anders Ek (Telelogic): Associate Rapporteur for Basic Concepts

**Oystein Haugen (Norwegian Computing Center):
Associate Rapporteur for Structural Concepts**

**Sjouke Mauw (Eindhoven University of Technology):
Associate Rapporteur for Formal Semantics**

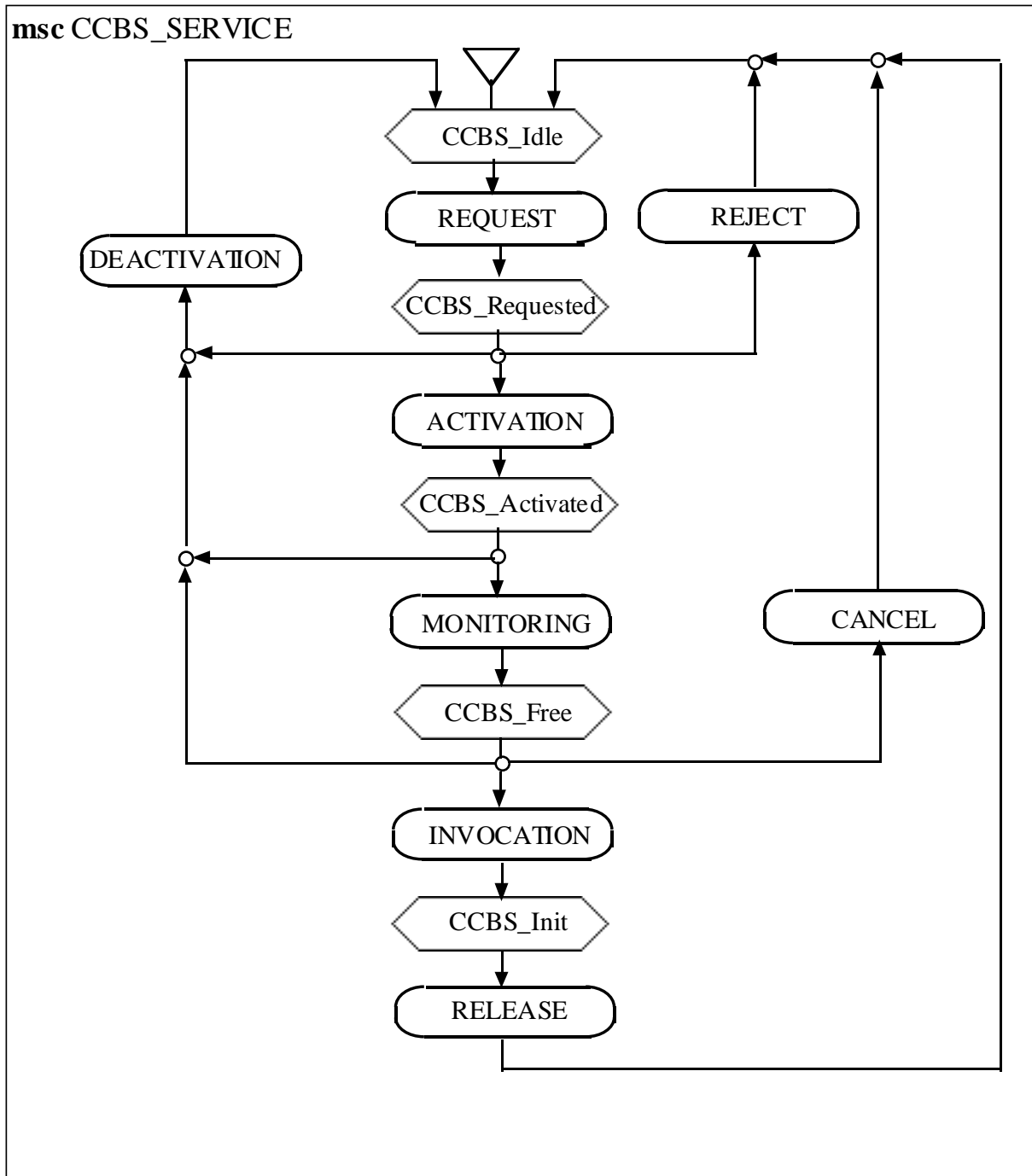
Ekkart Rudolph (TUM): Rapporteur

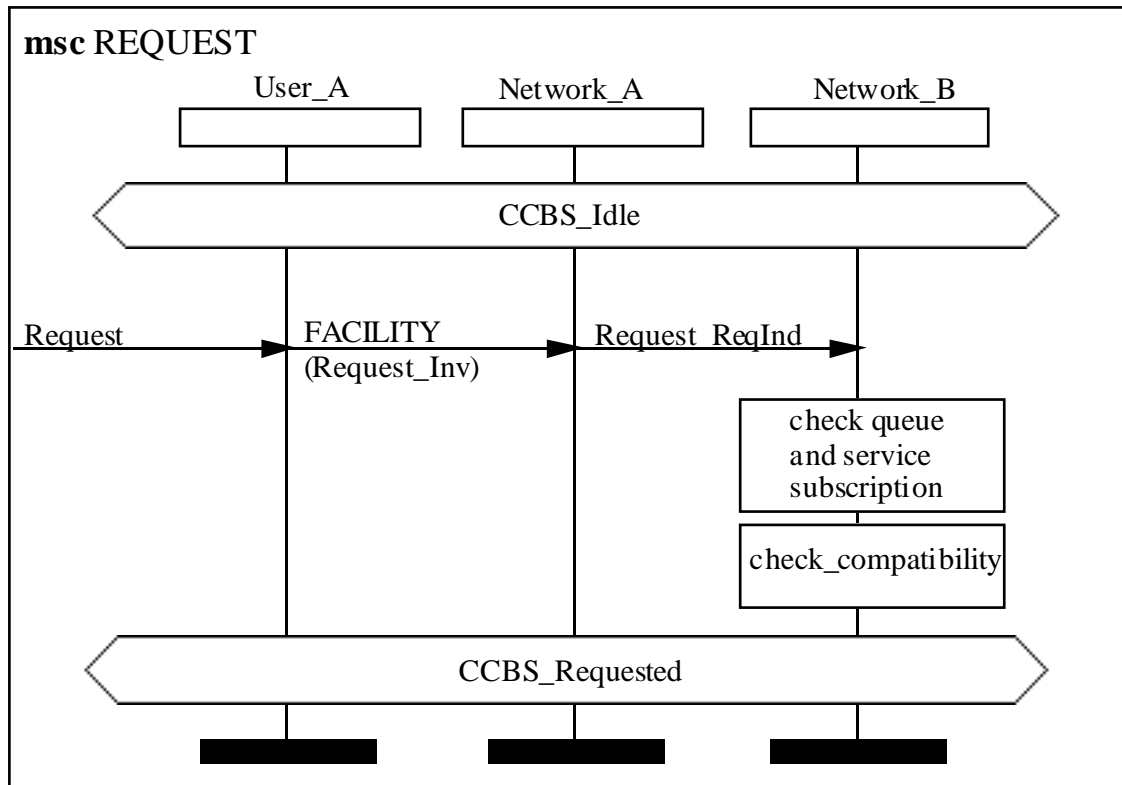
8 - 12 January 1996: Editorial Meeting in Munich (TUM)

10 February 1996: 'White Document' -> ITU

10 - 18 April 1996: ITU-Meeting (SG 10) in Geneva

**9 - 18 October 1996: World Telecommunication Standardization Conference/
Final Approval**

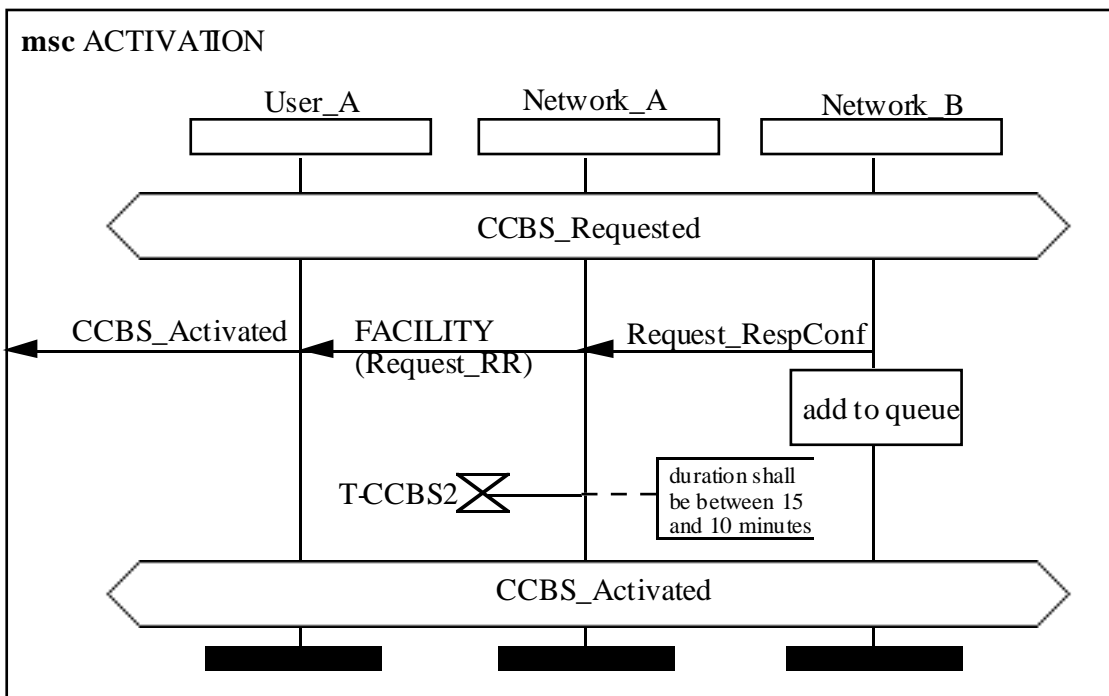
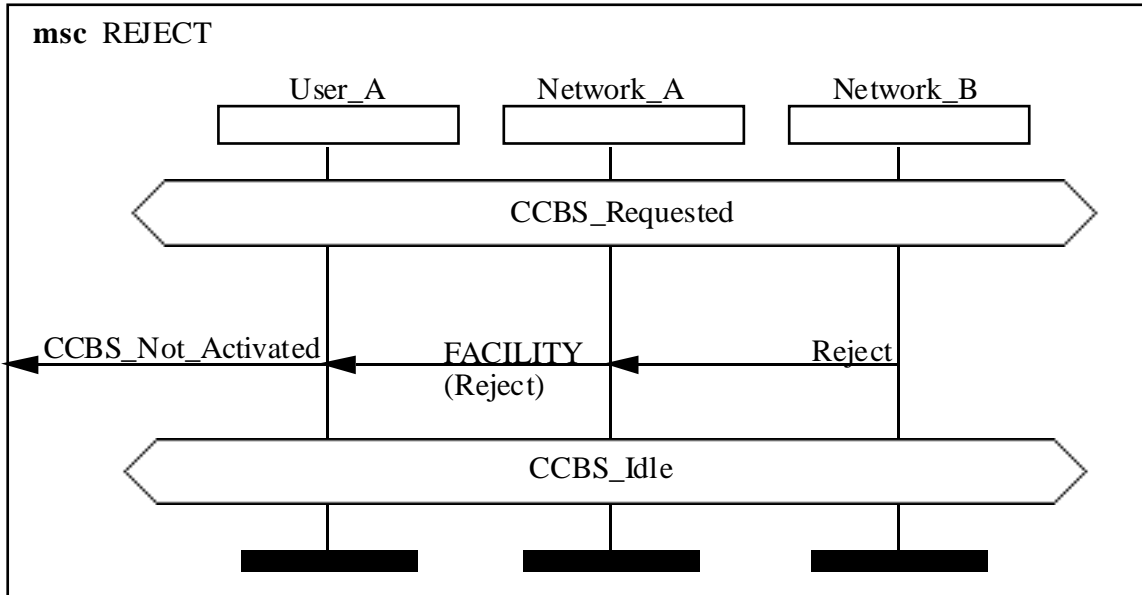


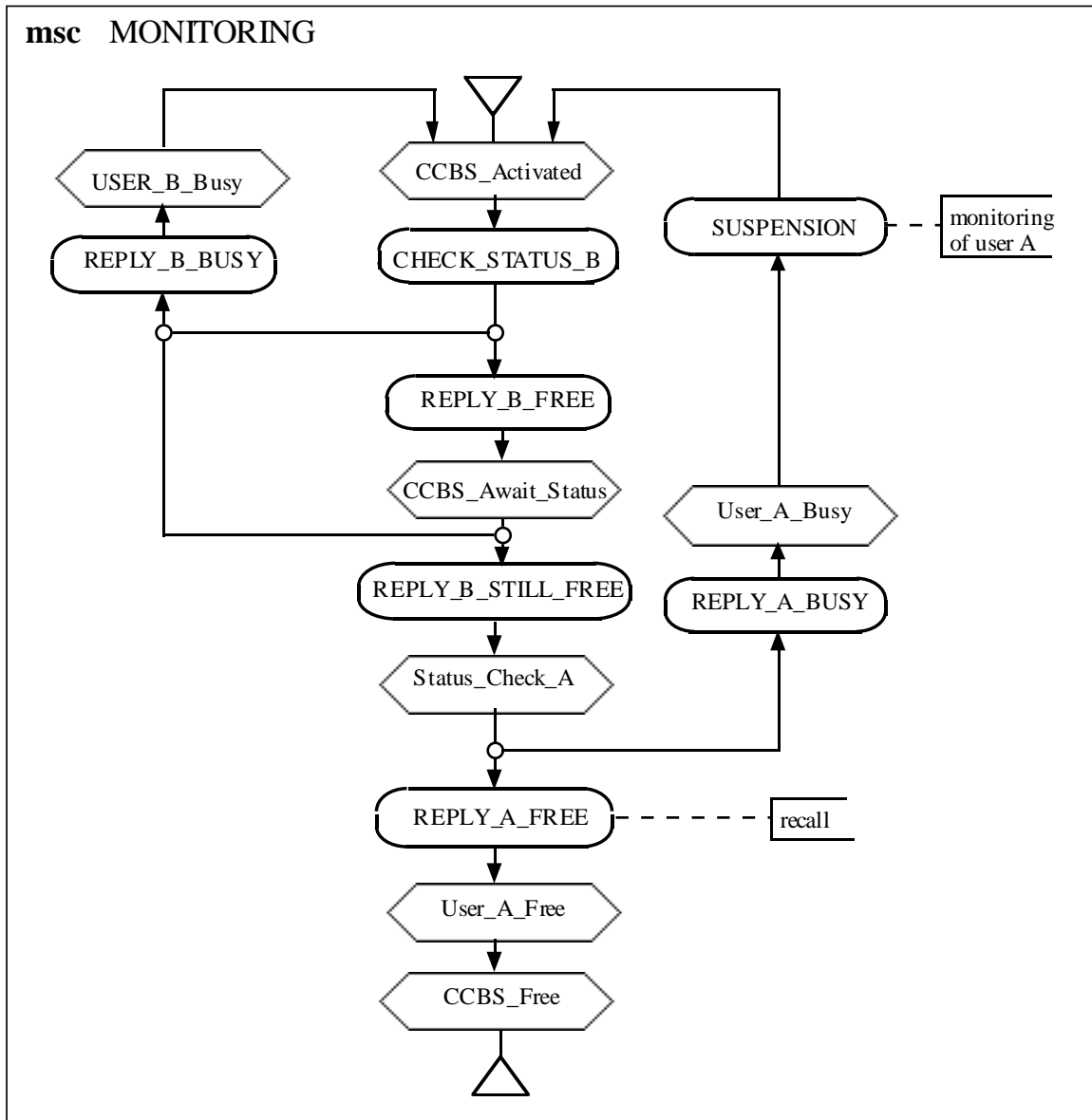


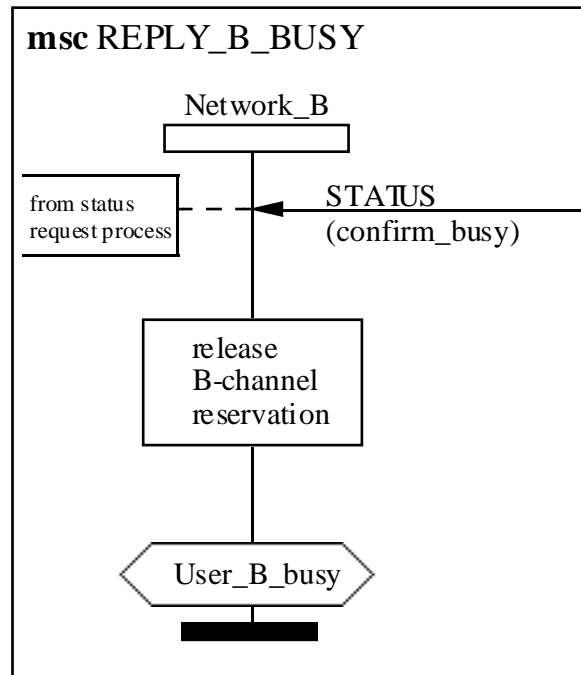
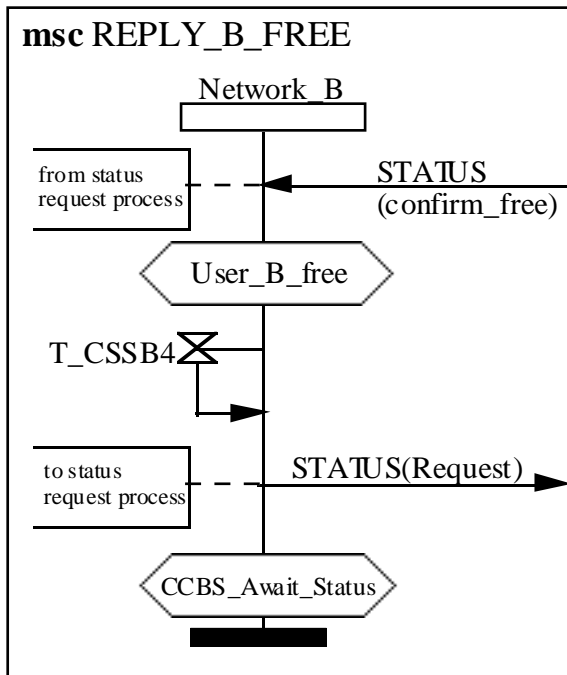
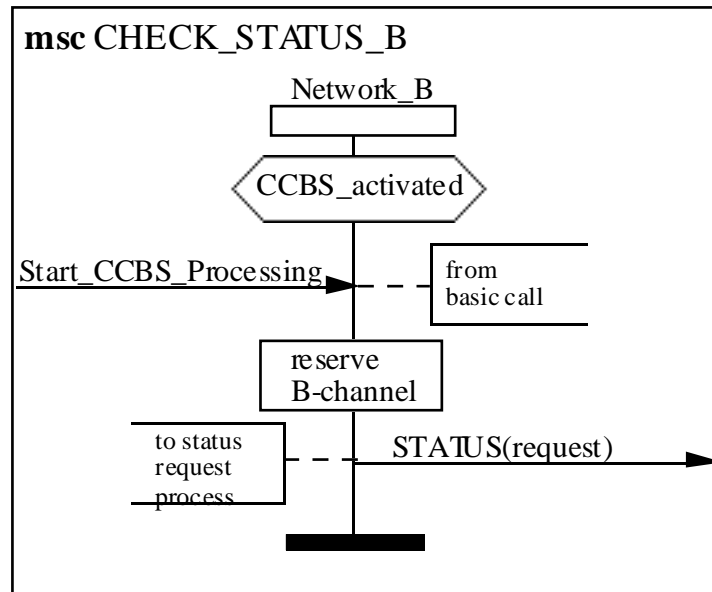
```

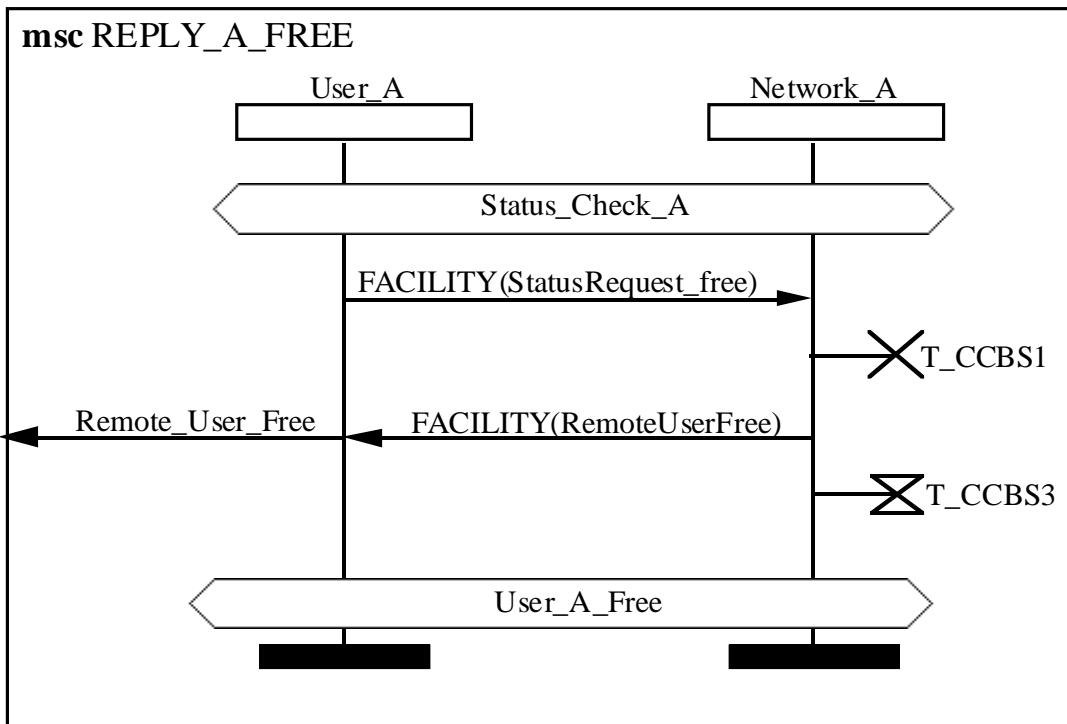
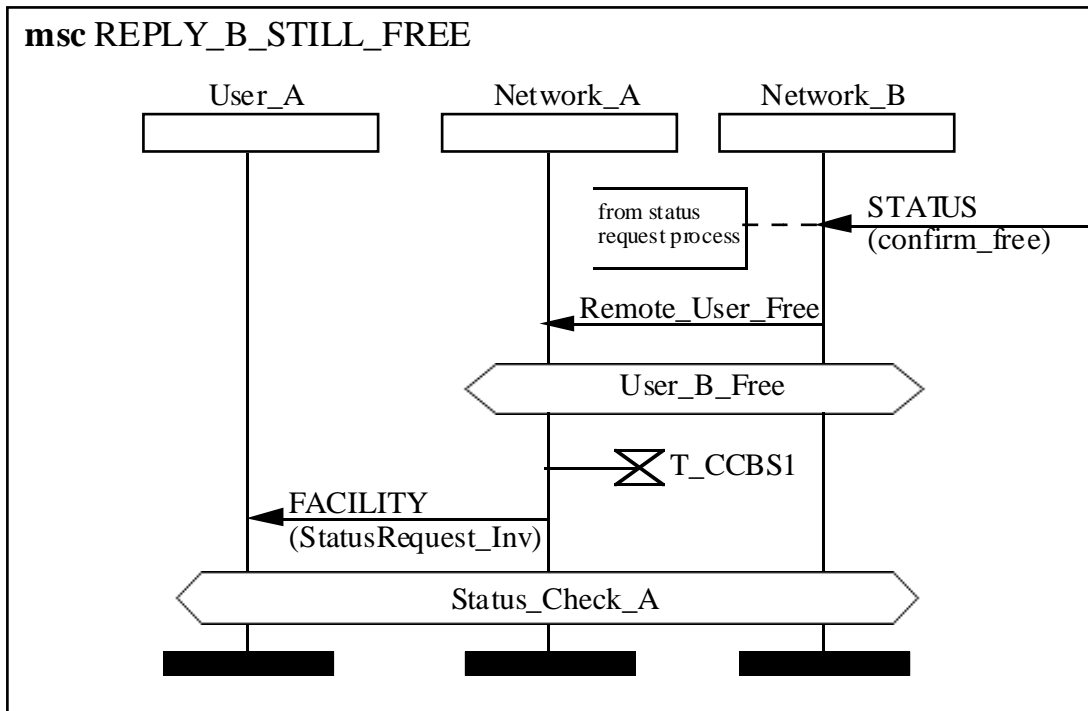
msc REQUEST; inst User_A, Network_A, Network_B;
  User_A:      instance;
  Network_A:   instance;
  Network_B:   instance;
  all:       condition CCBS_Idle;
  User_A:      in Request from env;
                out FACILITY (Request_Inv) to Network_A;
  Network_A:   in FACILITY (Request_Inv) from User_A;
                out Request_ReqInd to Network_B;
  Network_B:   in Request_ReqInd from Network_A;
                action 'check_queue and service subscription';
                action 'check_compatibility';

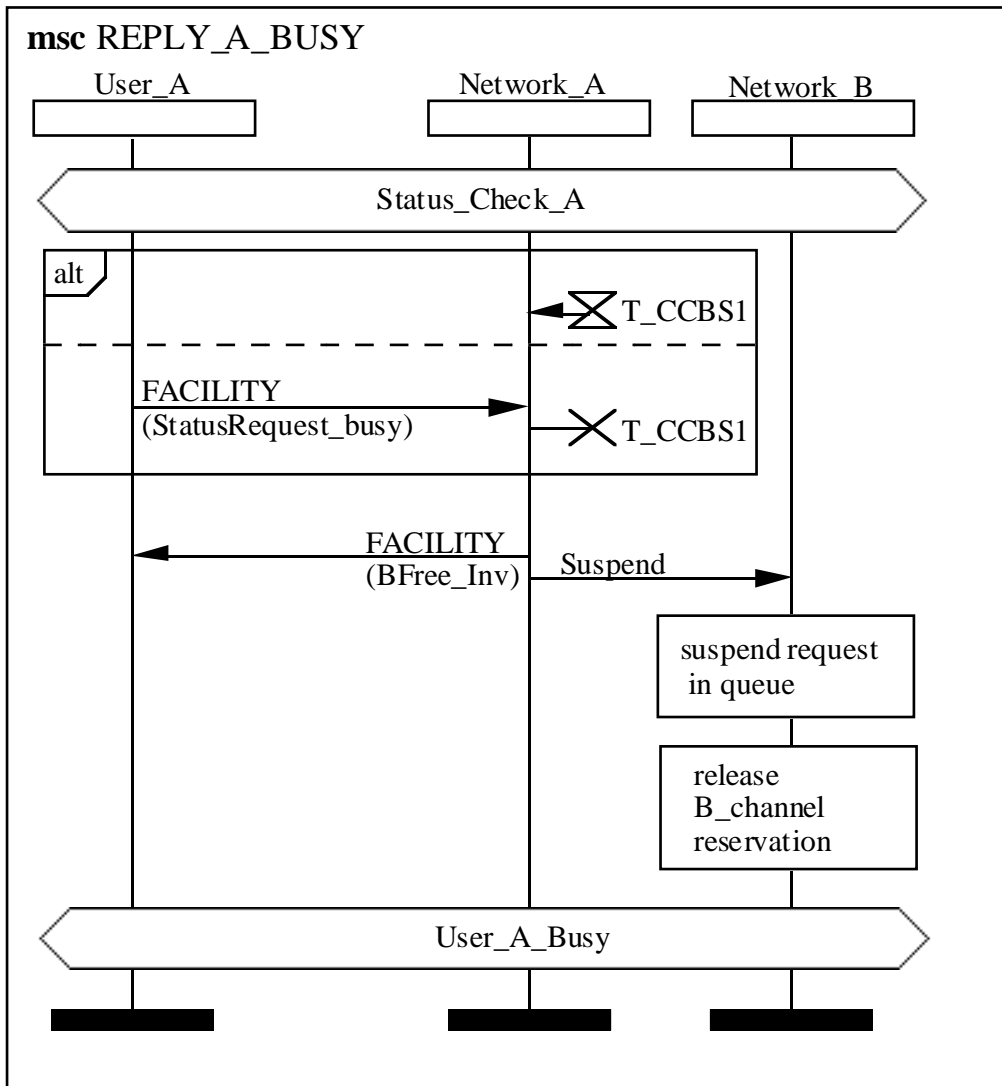
  all:       condition CCBS_Requested;
  User_A:      endinstance;
  Network_A:   endinstance;
  Network_B:   endinstance;
endmsc;
  
```

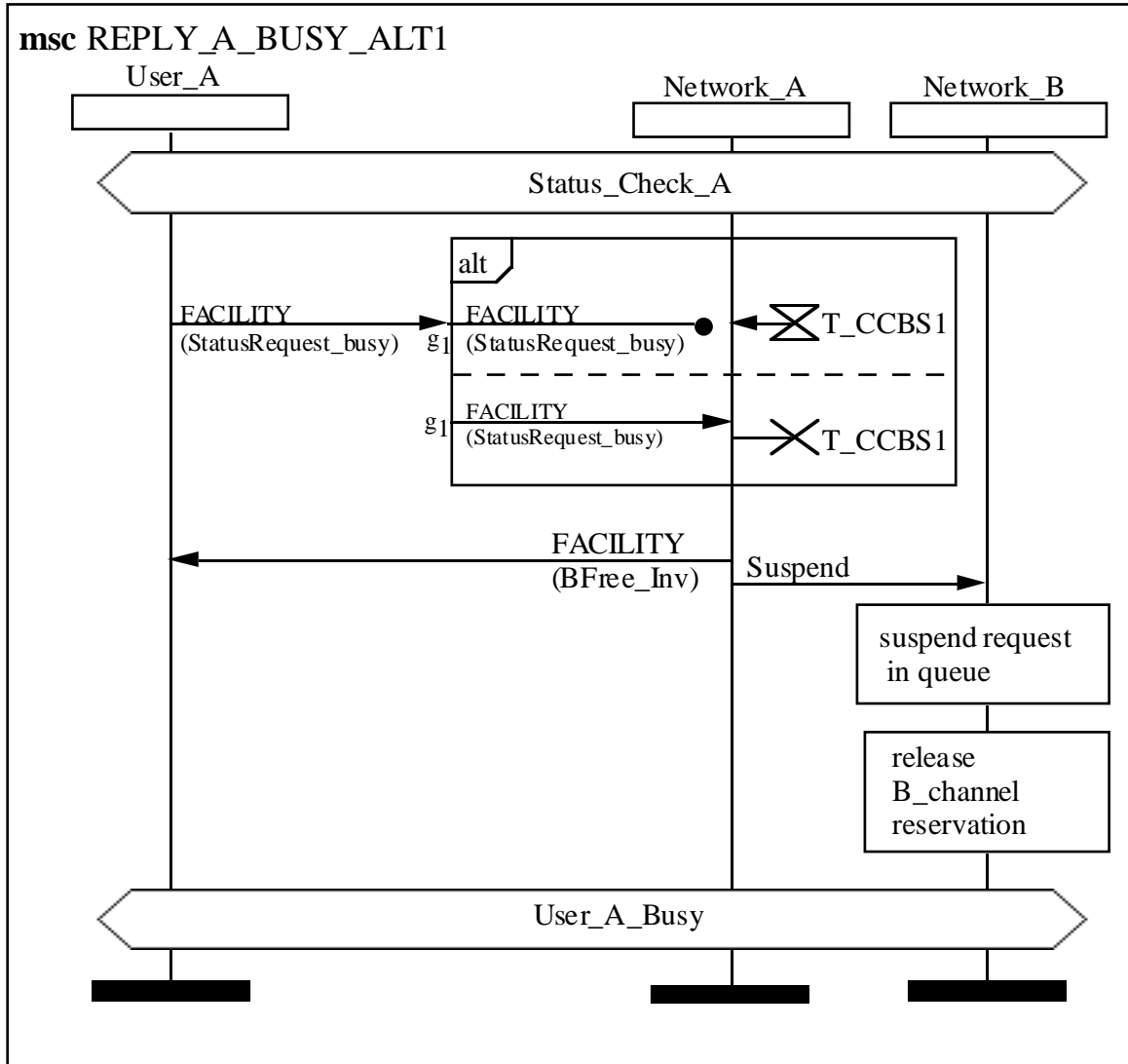


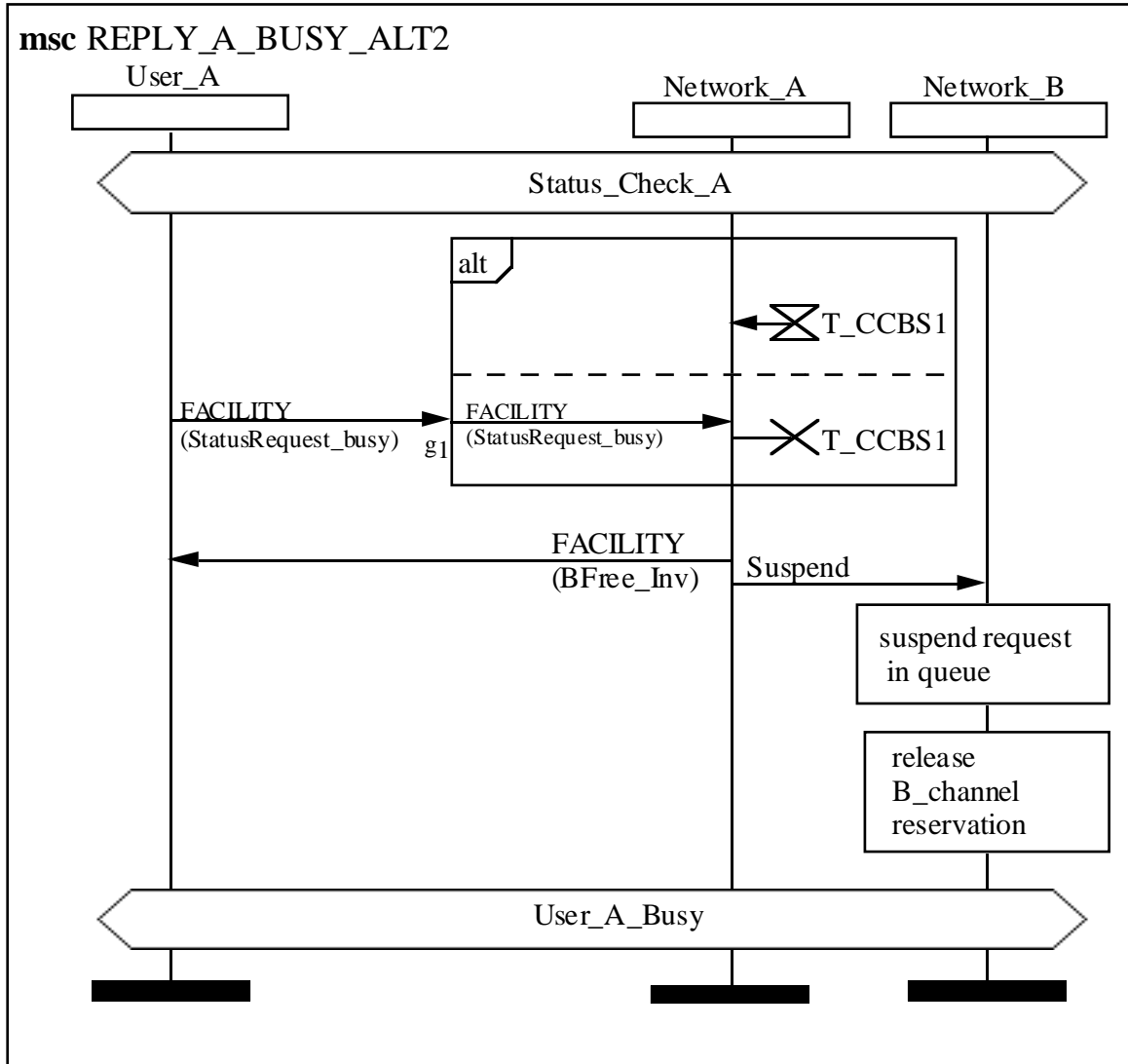


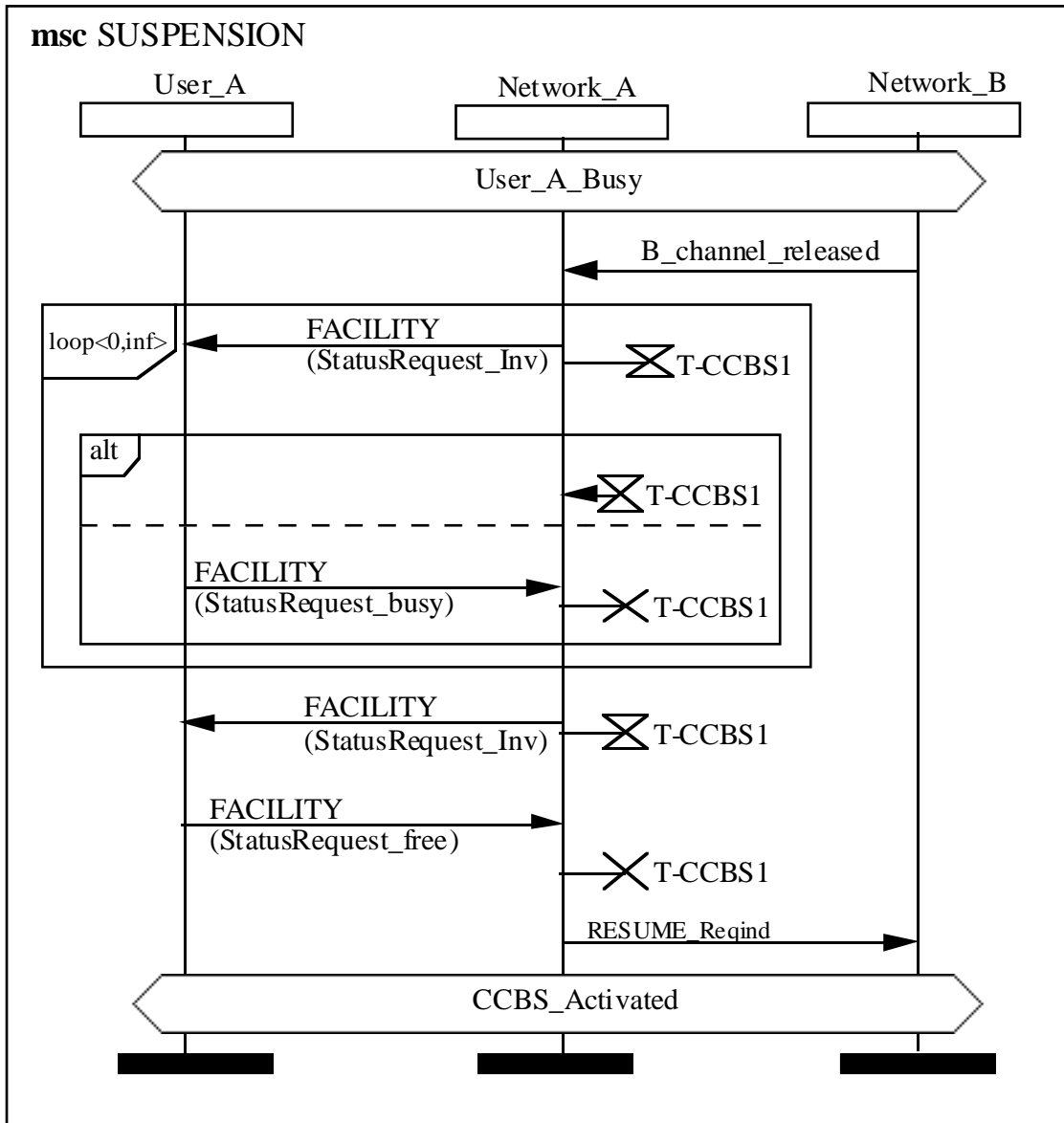


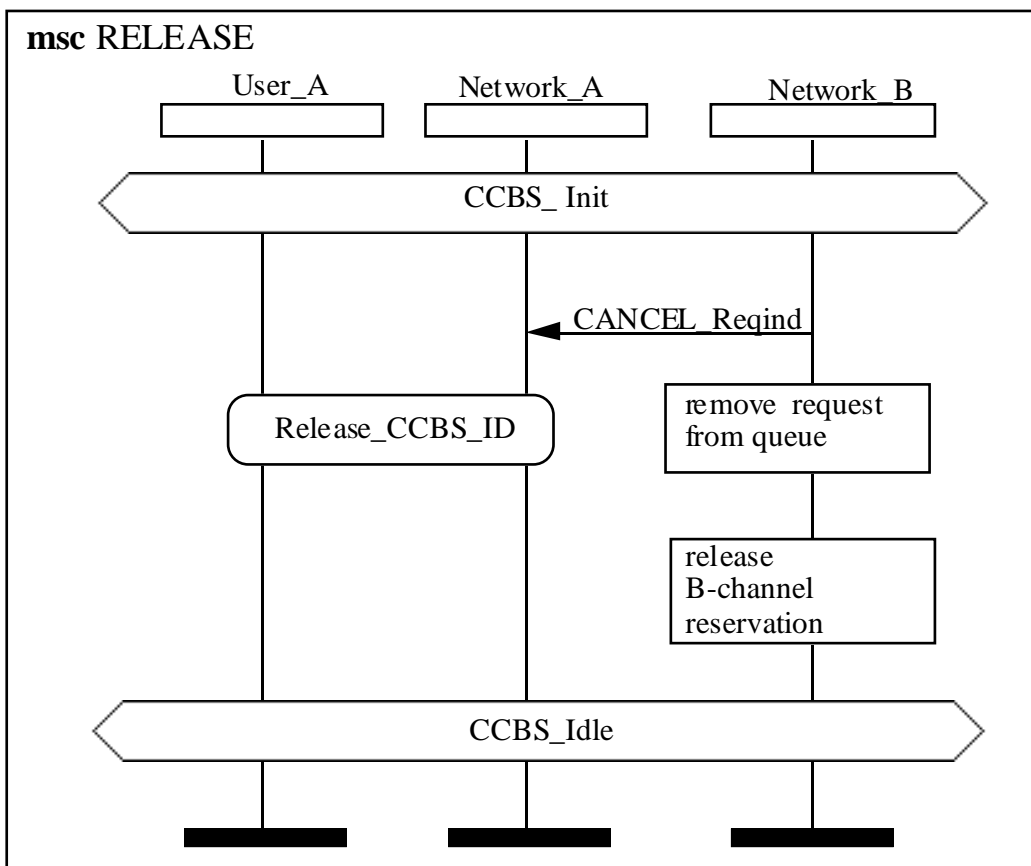
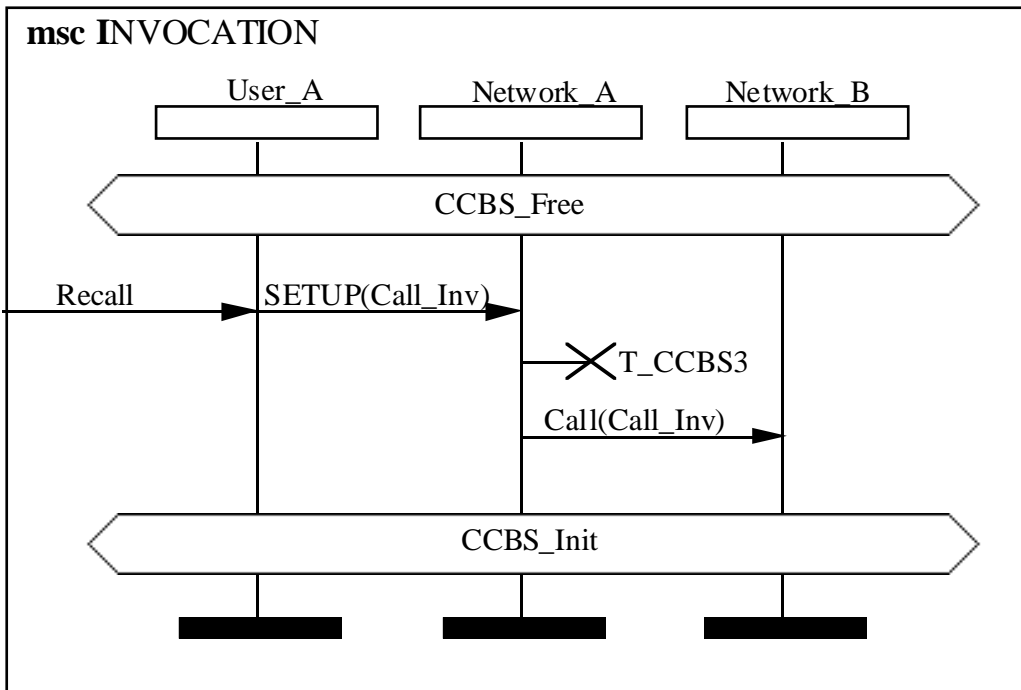


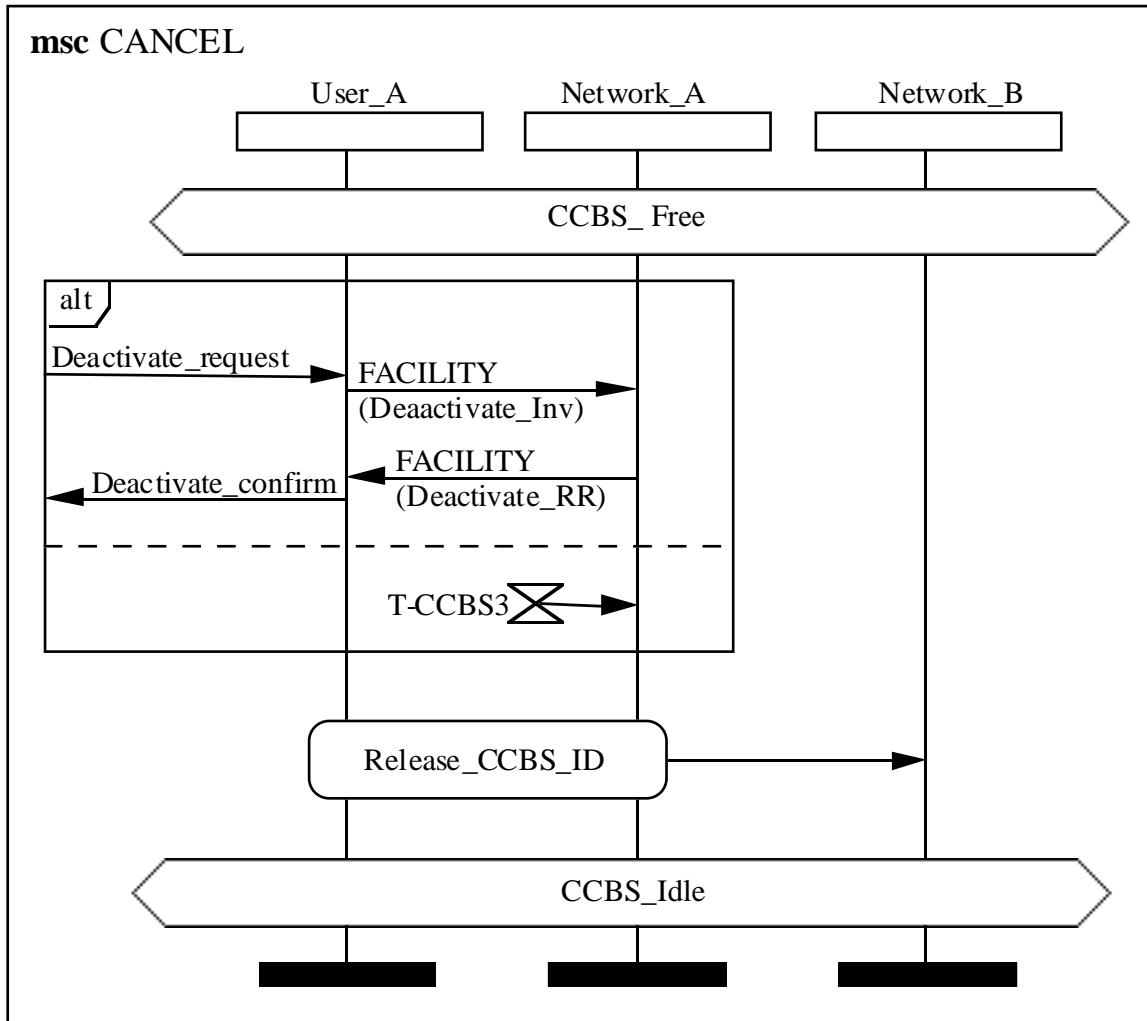


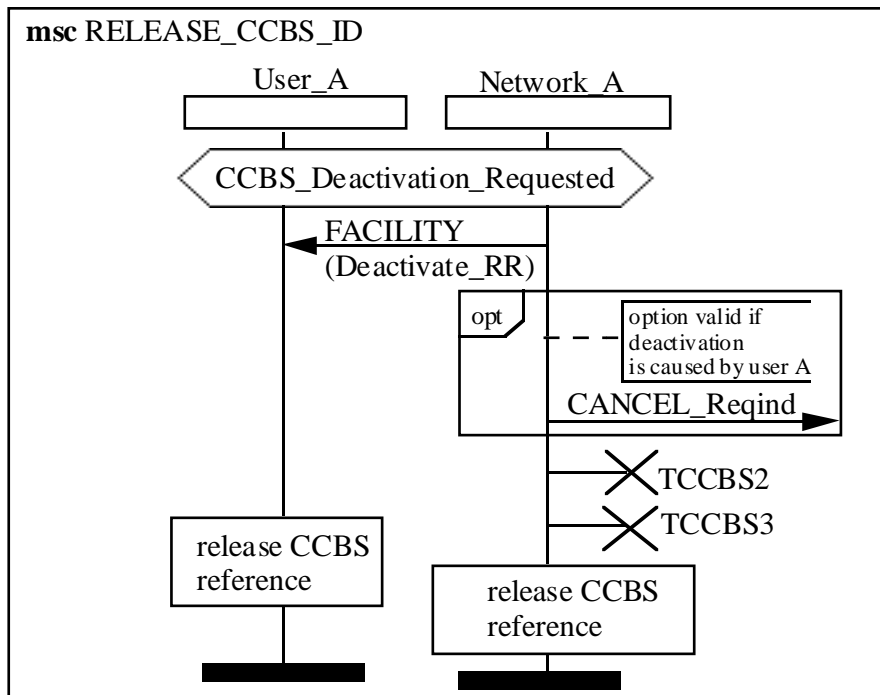
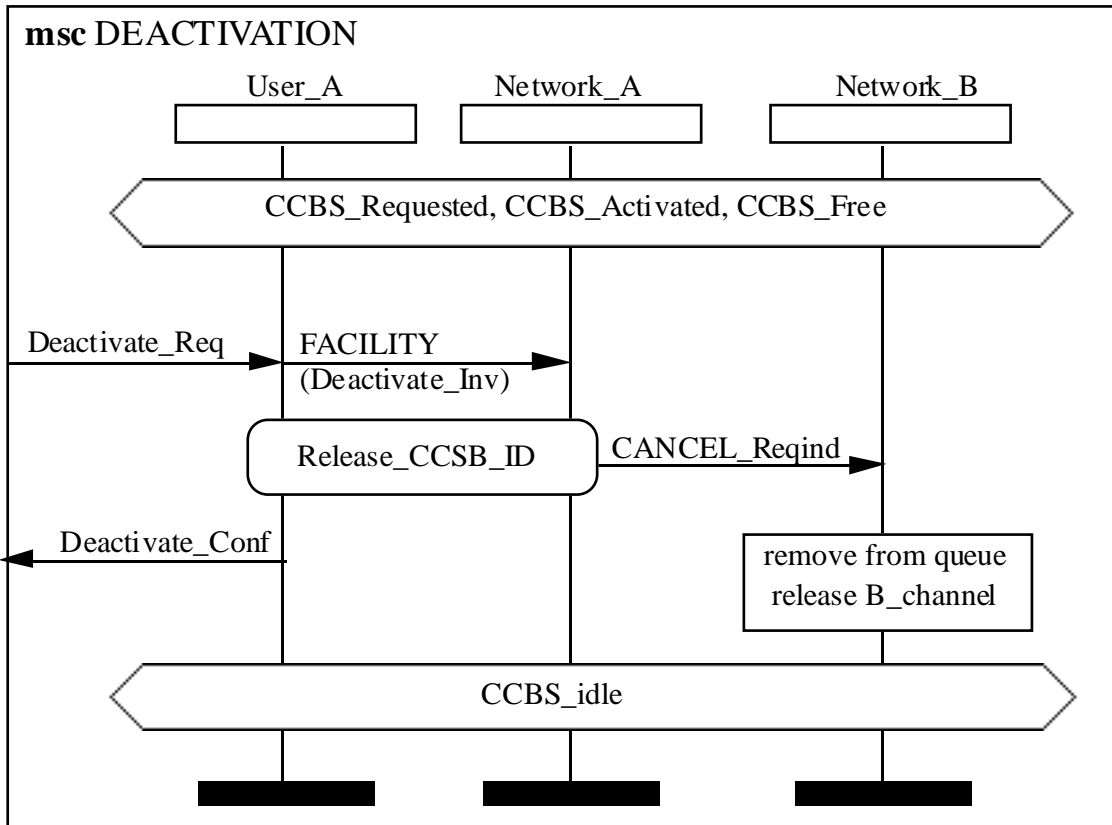


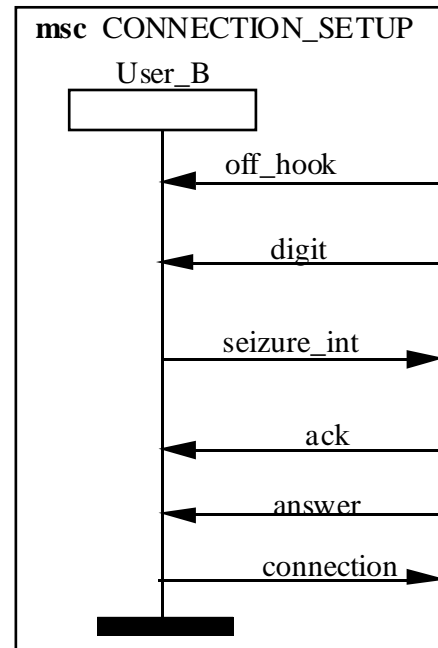
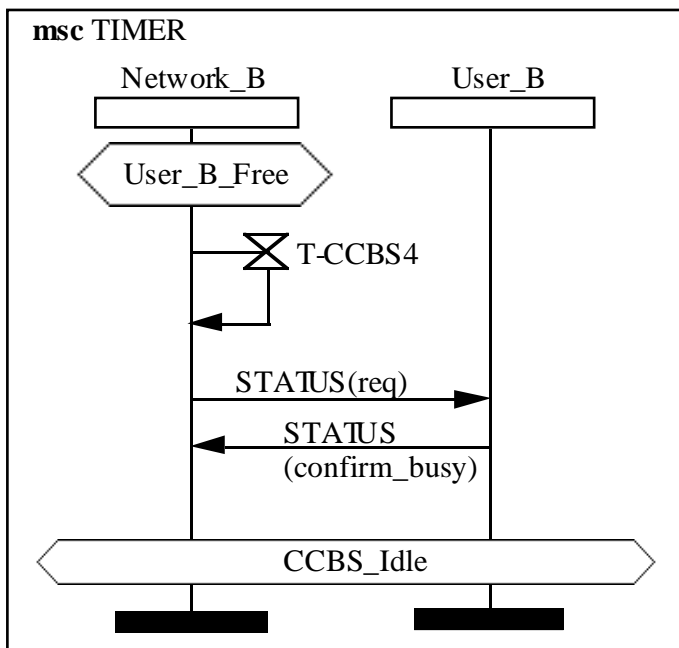
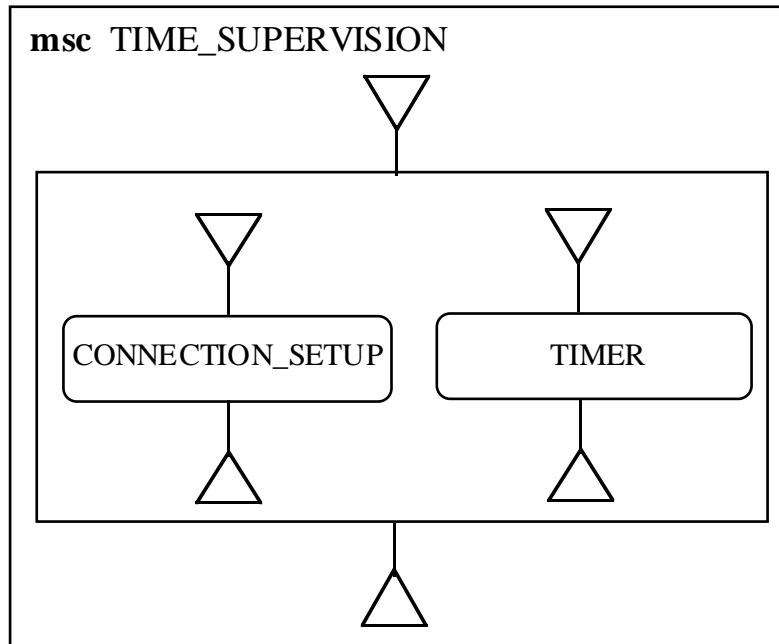


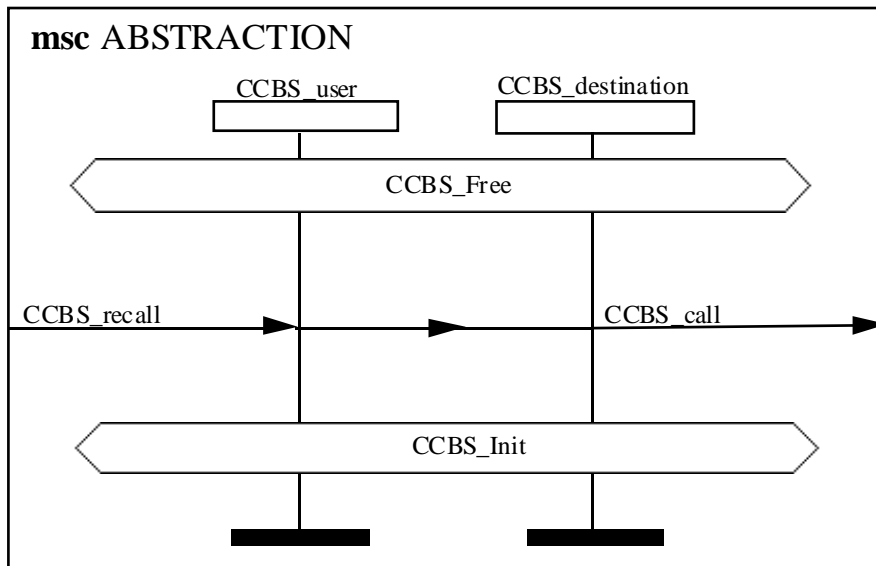
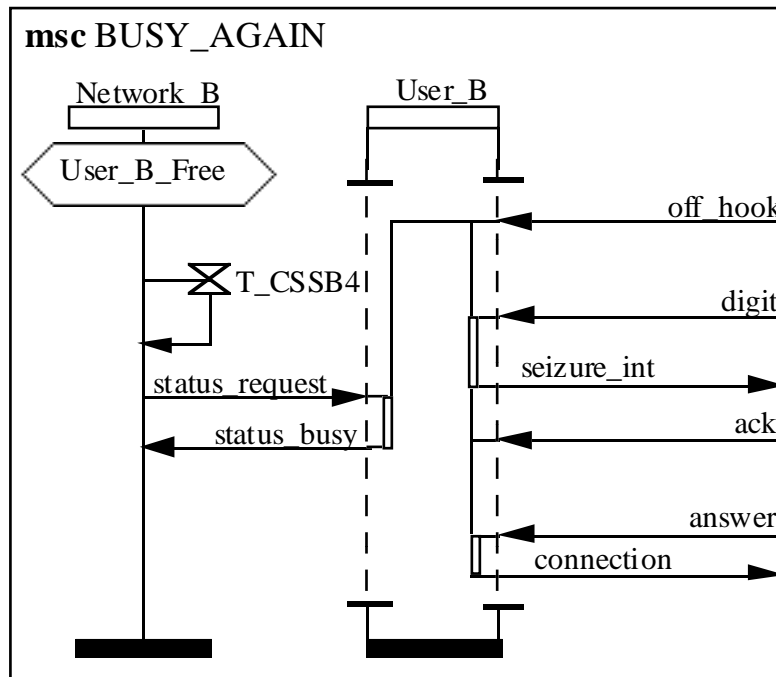


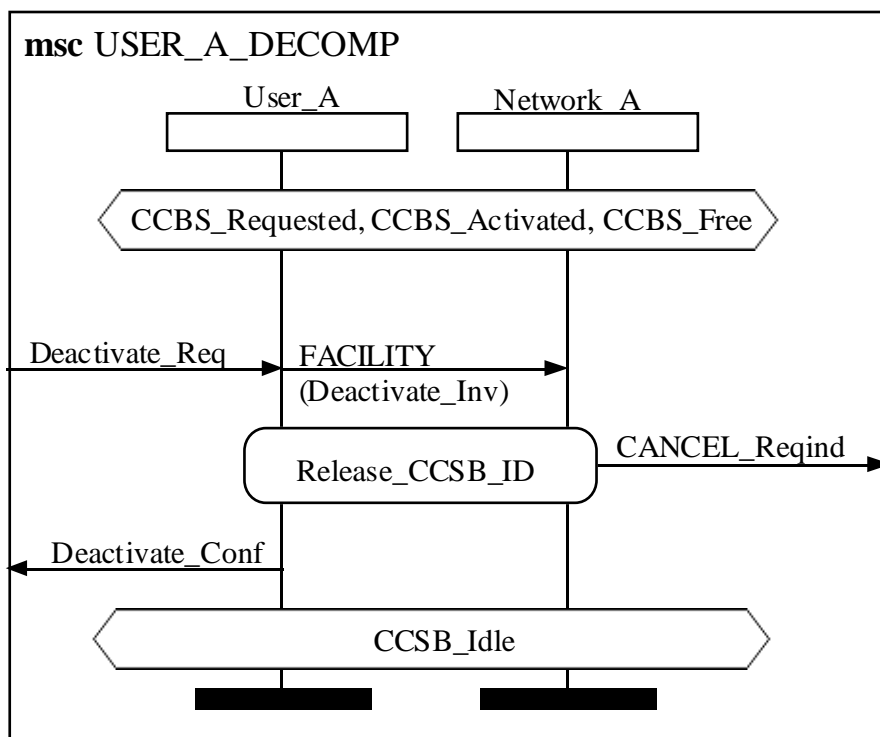
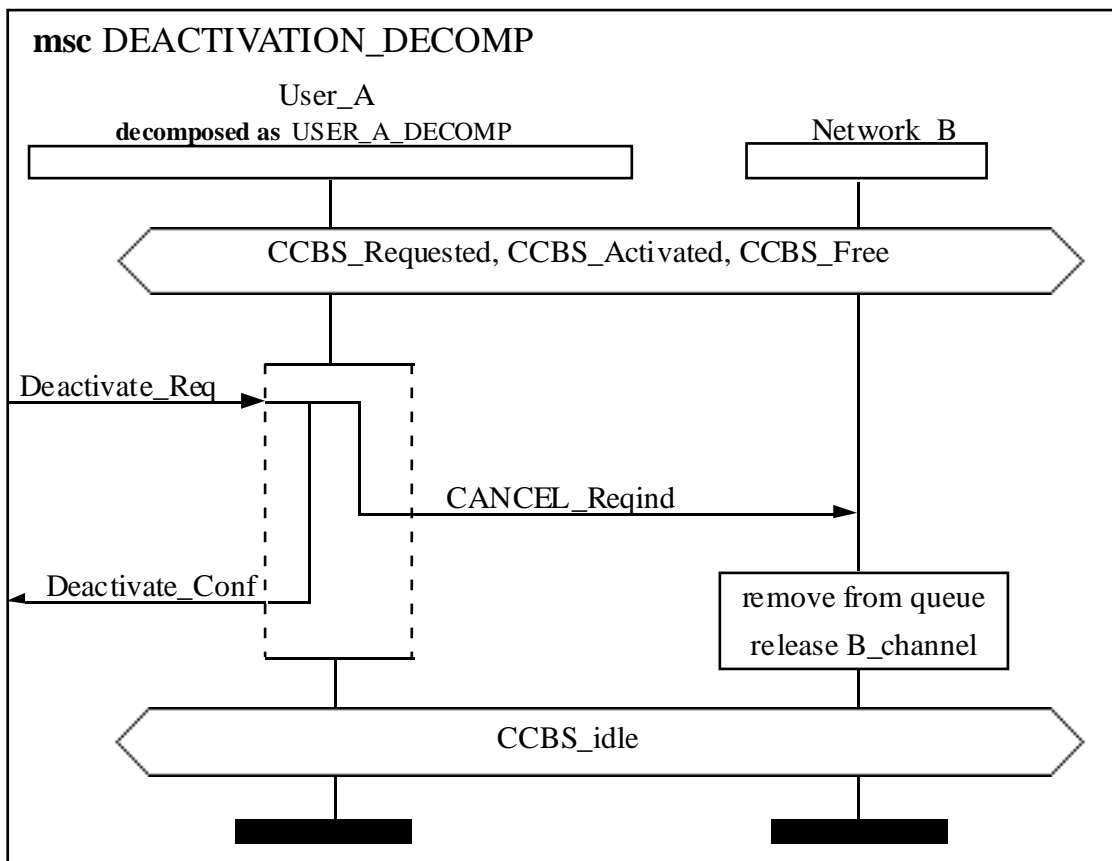


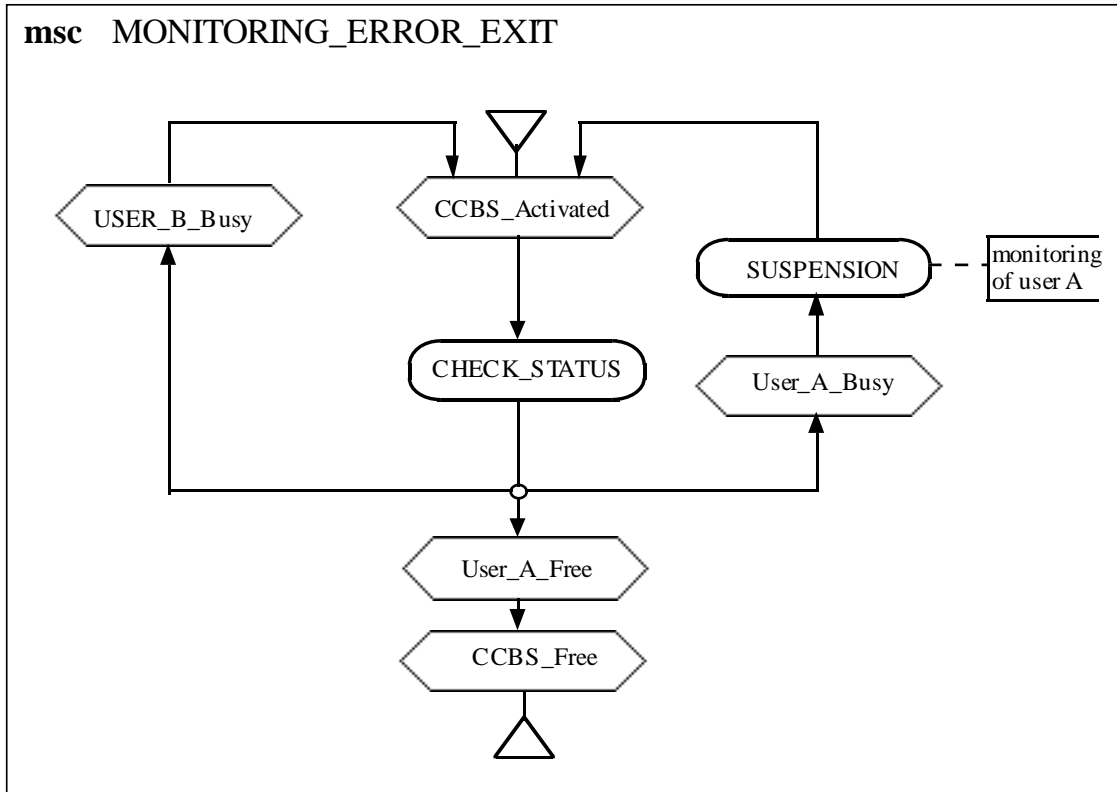


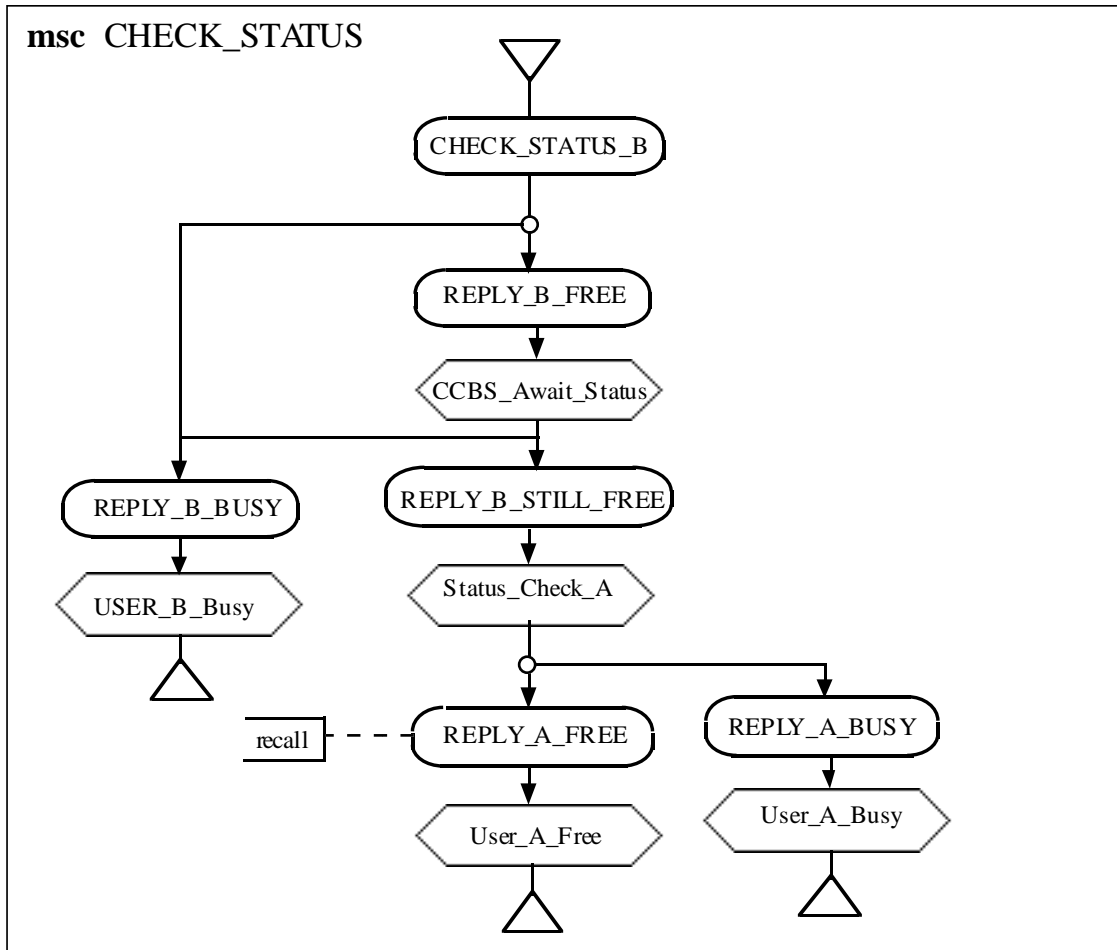


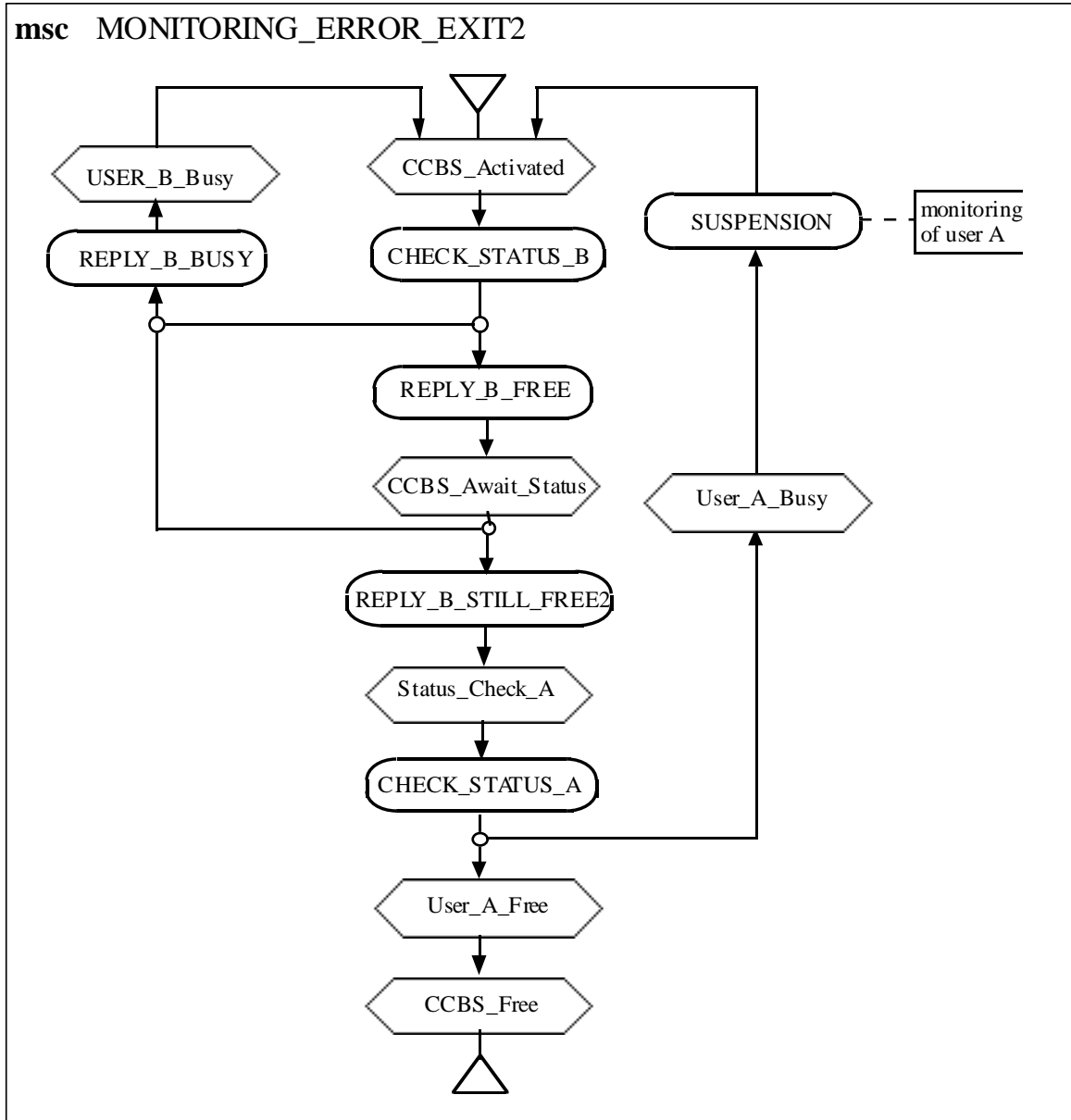


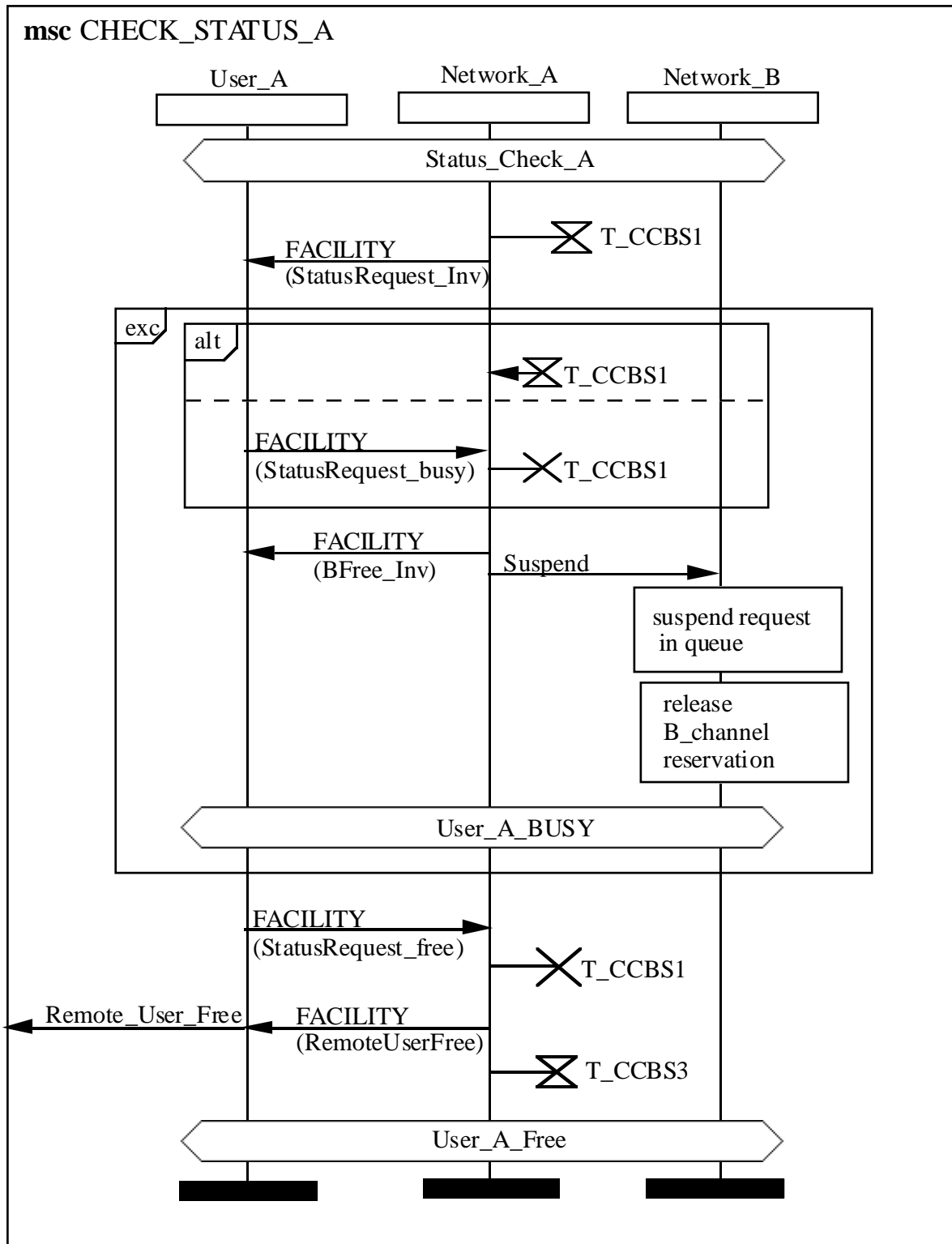


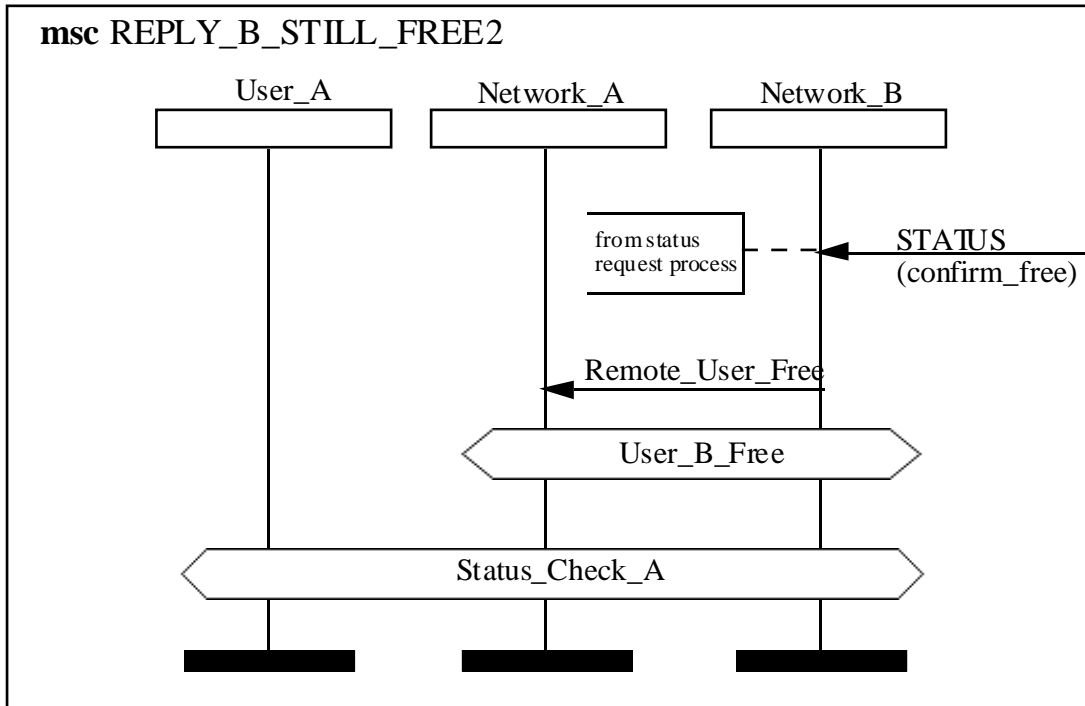












Outlook

Specific task objectives with expected time frames for completion

1. Revised Annexes B and C (formal semantics) corresponding to MSC-96 should be provided by 2H 97
2. An addendum to Z.120 should be provided by 2H 98
3. A corresponding Addendum of formal semantics (Annex B and Annex C) should be provided by 2H 99
4. A revised recommendation Z.120 should be provided by 2H 2000
5. Revised Annexes B and C (formal semantics) corresponding to MSC-2000 should be provided by 2H 2001

Outlook

Open items to Z.120 to be studied

Below we have listed a number of areas where we know that further study of MSC could improve MSC in the future. The points listed below the area headlines are examples of what subjects we would study under the area, but those subjects are not meant to be excluding other topics in the areas.

1. *Non-functional properties*

- real-Time descriptions such as duration
- quality of Service properties such as performance, error rates etc

2. *Methodology*

- use of MSC in object-oriented modelling e.g. formalizing use cases
- test case specifications
- issues related to the use of MSC in close connection with SDL e.g. timer parameters

3. *Data concepts*

- use of formal data definitions in messages, parameters, conditions and actions

4. *Grammars and exchange formats*

- improvement of the graphical grammar based e.g. on the study of graph grammar formalisms
- revision of textual grammars including the production of a Common Interchange Format for MSC

5. *Conditions*

- strong global condition concept
- general predicates in conditions
- further investigation of the relation between composition mechanisms based on conditions and those based on process algebra operators

6. *Other language issues*

- remote procedure
- synchronous communication construct
- grouping of instances
- hierarchy of messages
- additional MSC operators e.g. disruption, interruption
- total ordering of events
- gates in HMSCs