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Title	Fixes for Network Entry Flow Charts	
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Re:	IEEE Std 802.16-2004/Cor2/D1	
Abstract	Fixes for Network Entry Flow Charts in 802.16-2004/Cor2/D1	
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Fixes for Network Entry Flow Charts

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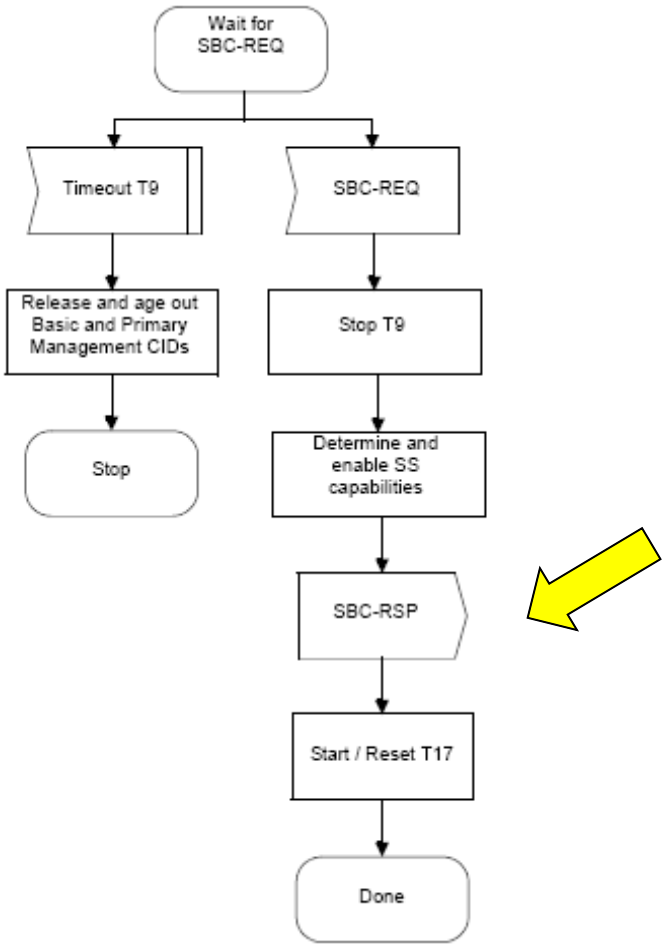
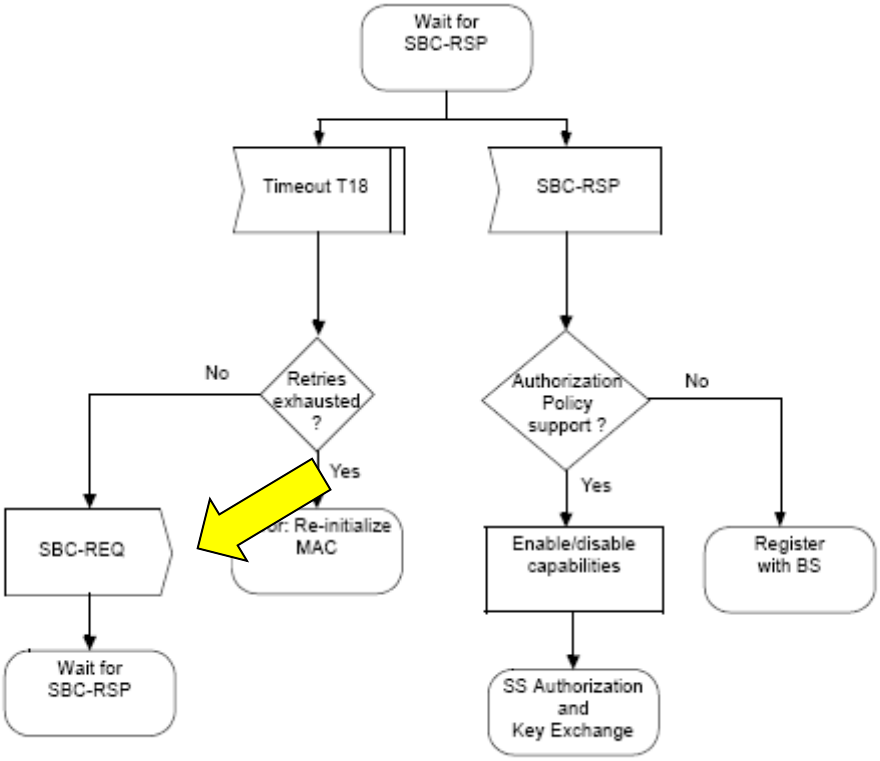
Problem definition

The following problems were identified in SBC and REG transactions:
There is an unclear definition of how to handle expiration of T9 in the BS side in SBC transaction, and expiration of T17 in the BS side in REG transaction. The condition for "Release and age-out connections" is unclear and not well defined. In addition, this action is local to the BS and thus remains unknown to the SS. We suggest that the BS would send unsolicited RNG-RSP message with Abort instruction when these timers expire.
The current Network Entry flow chart cannot handle retransmission, either due to processing delays or message drop. After the BS transmits a response message, it will proceed directly to the next state in the Network Entry flow and thus cannot handle a retransmission of request by the SS; this would cause the Network Entry procedure to end in failure. For example, the following flow chart (Figure 67 in 802.16e-2005) shows that BS sends SBC-RSP.
There is an ambiguity as to whether or not the BS must send an RNG-RSP message with status success when there are no corrections, or if it can just send a CDMA_Allocation_IE.



If the SS does not receive SBC-RSP within T18 timeout, it will retransmit the SBC-REQ (Figure 66).



However after sending SBC-RSP, the BS proceeds directly to the registration step. The corresponding flow chart (Figure 70) does not contain any state where a retransmission of SBC-REQ can be received and processed. This is just an example of one single scenario. Similar failures can be identified for other steps in the entire Network Entry flow.

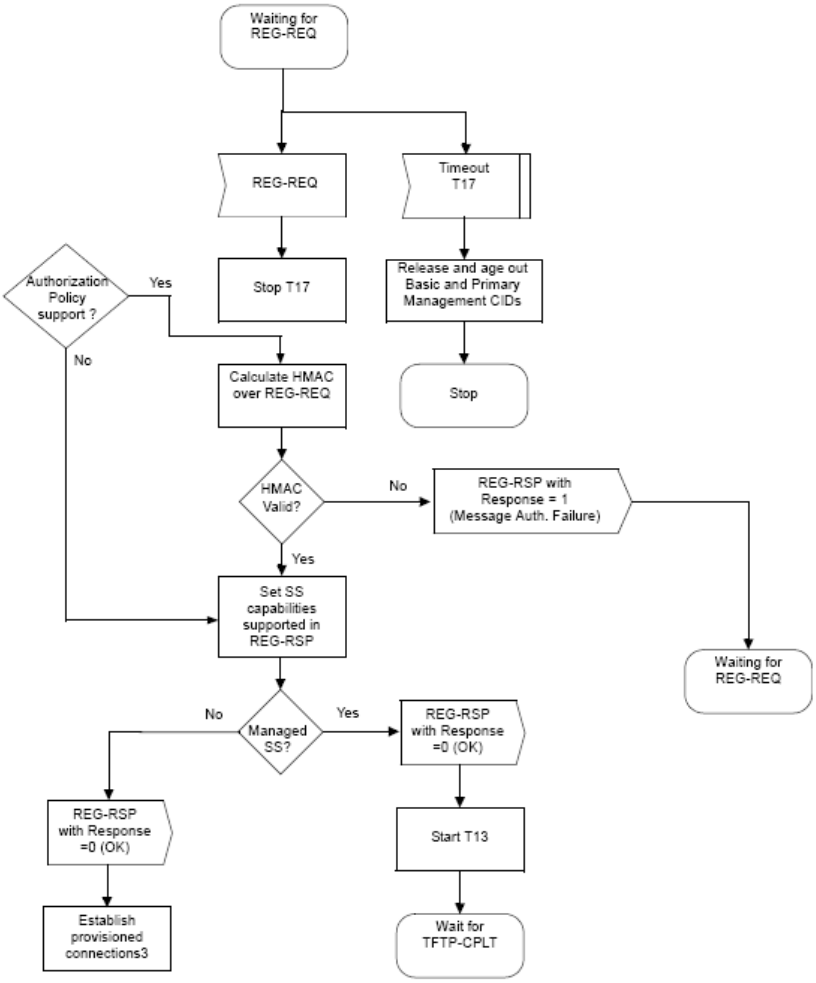


Figure 70—Registration—BS

We suggest the Network Entry process be specified using 1) Network Entry state machine, and 2) set of actions/procedures of handling the Network Entry messages. This will provide a clearer definition of the network entry procedure as well as the handling of error/failure conditions.

Suggested remedy:

In Cor2_D1, replace Figure 67 in 6.3.9.7 with the following Figure 67a and 67b:

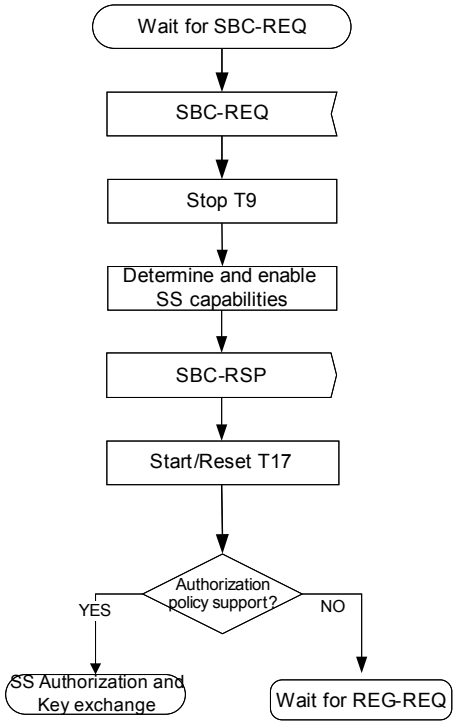


Figure 67a-Handle SBC-REQ first reception, BS side.

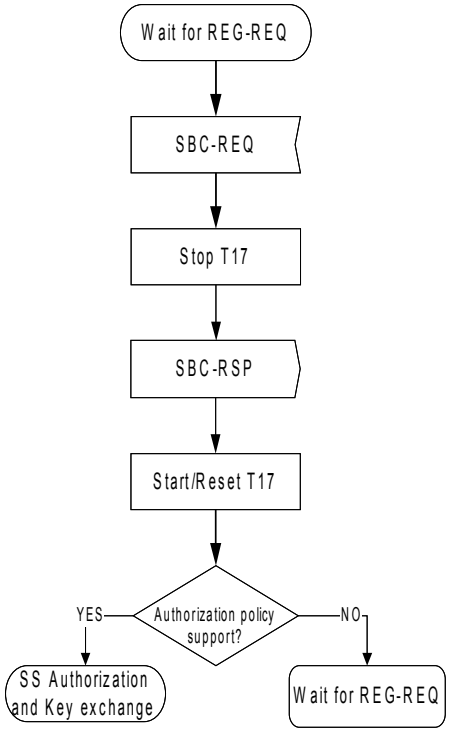


Figure 67b-Handle SBC-REQ retransmission, BS side.

In Cor2_D1, remove Figure 68 in Section 6.3.9.9

In Cor2_D1, replace Figure 69 in 6.3.9.9 with the following figure:

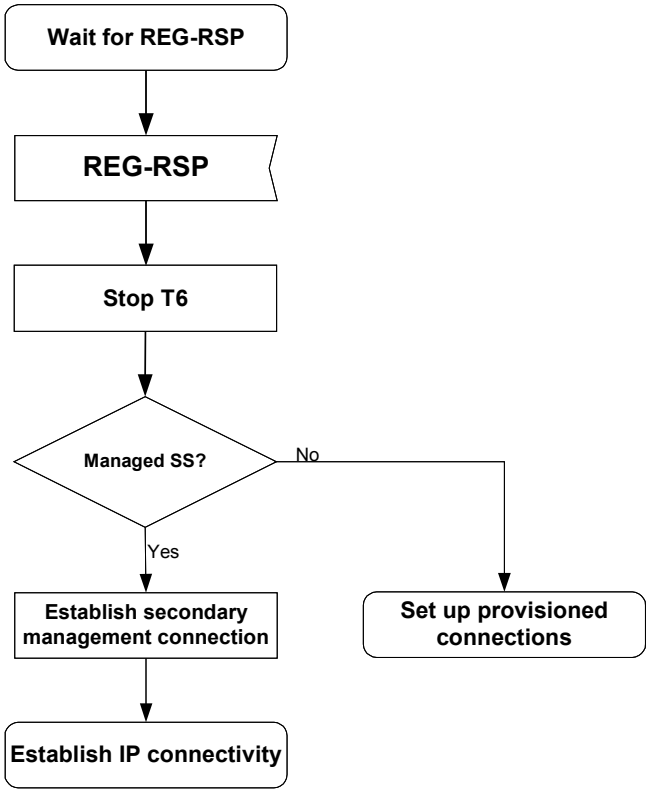


Figure 69 – Handle REG-RSP, SS side.

In Cor2_D1, replace in 6.3.9.9 Figure 70 with the following Figure 70a and Figure 70b:

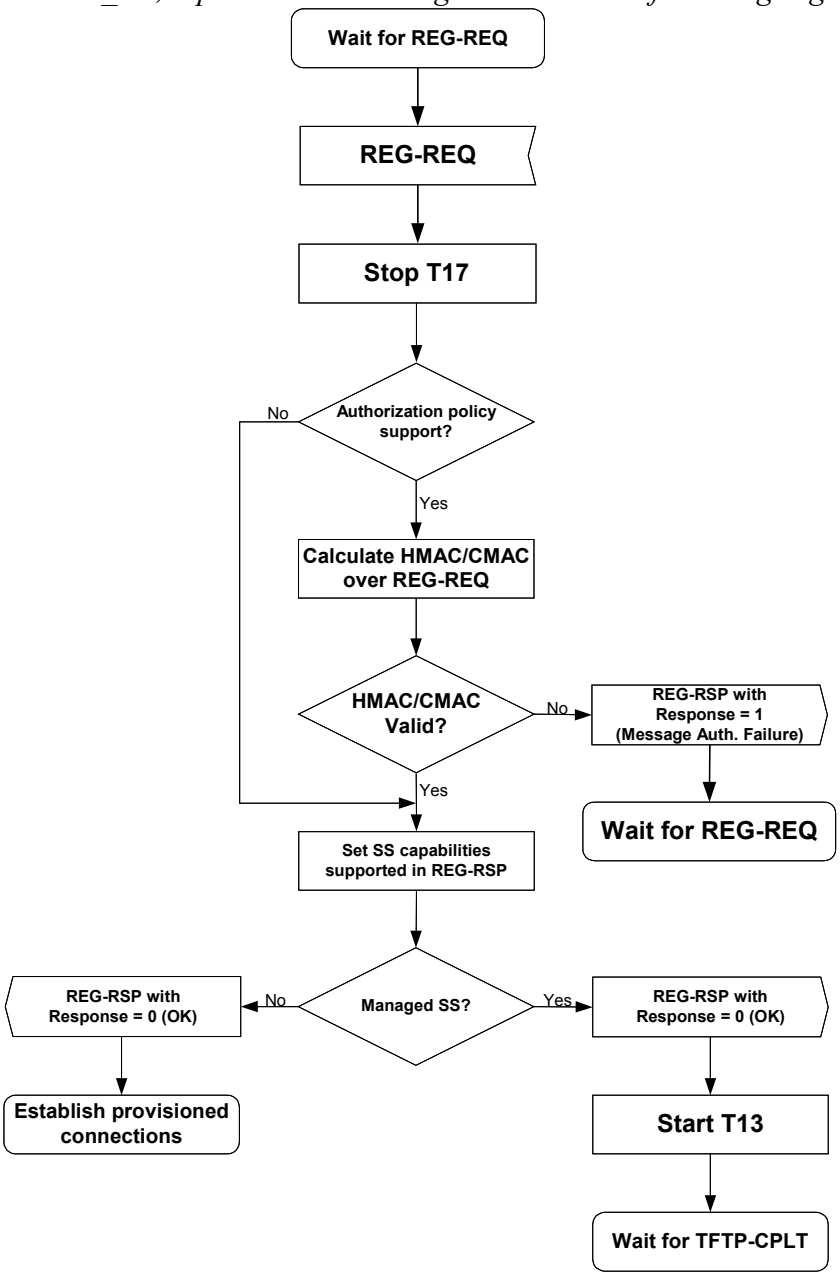


Figure 70a – Handle REG-REQ first reception (BS side).

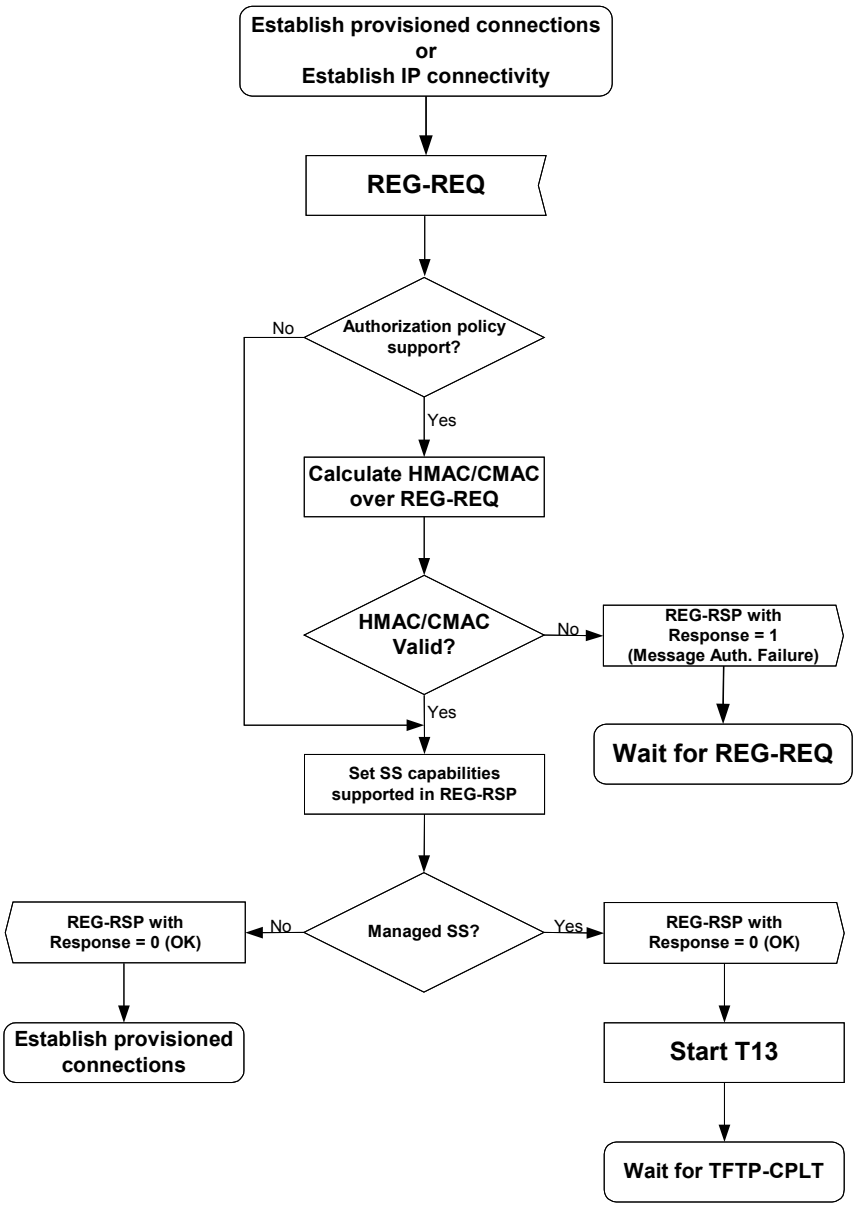


Figure 70b – Handle REG-REQ retransmission (BS side).

In Cor2_D1, Replace Figure 66 in 6.3.9.7 with the following figure:

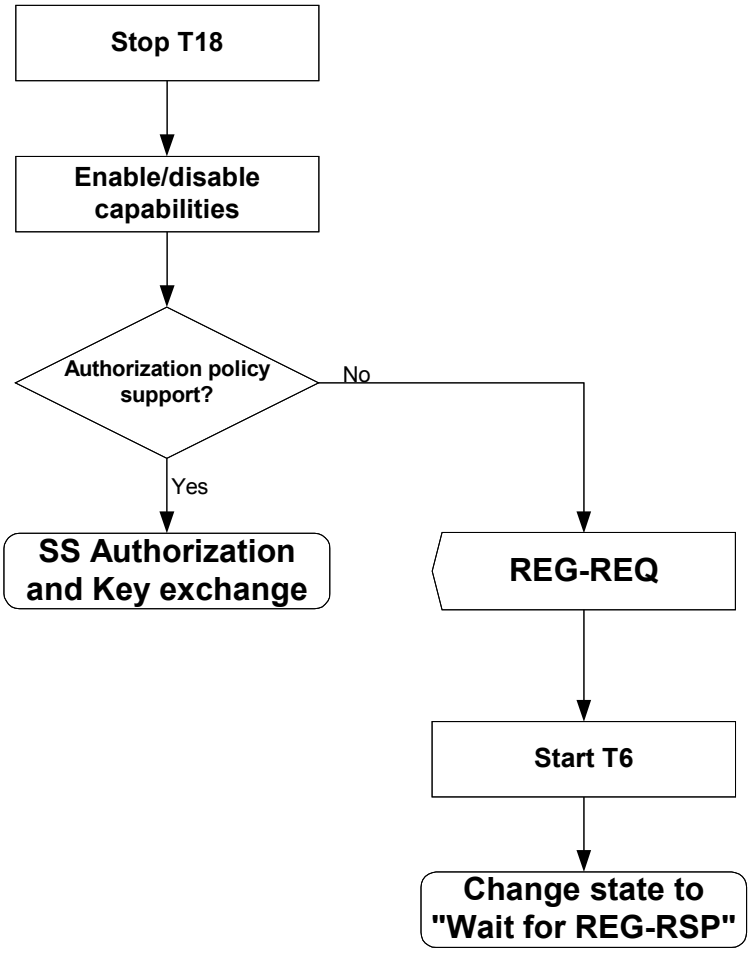


Figure 66 – Handle SBC-RSP, SS side.

In Cor2_D1, Section 6.3.10.3.1 page 116, add the following bullet in line 58:

When the BS receives an initial-ranging CDMA code that requires no corrections ~~results in sending an RNG-RSP message with success status~~, the BS shall provide BW allocation for the SS using the CDMA_Allocation_IE to send an RNG-REQ message. Sending RNG-RSP message with status "Success" is optional.

In Cor2_D1, replace Figure 87 with the following Figure 87a, Figure 87b and Figure 87c:

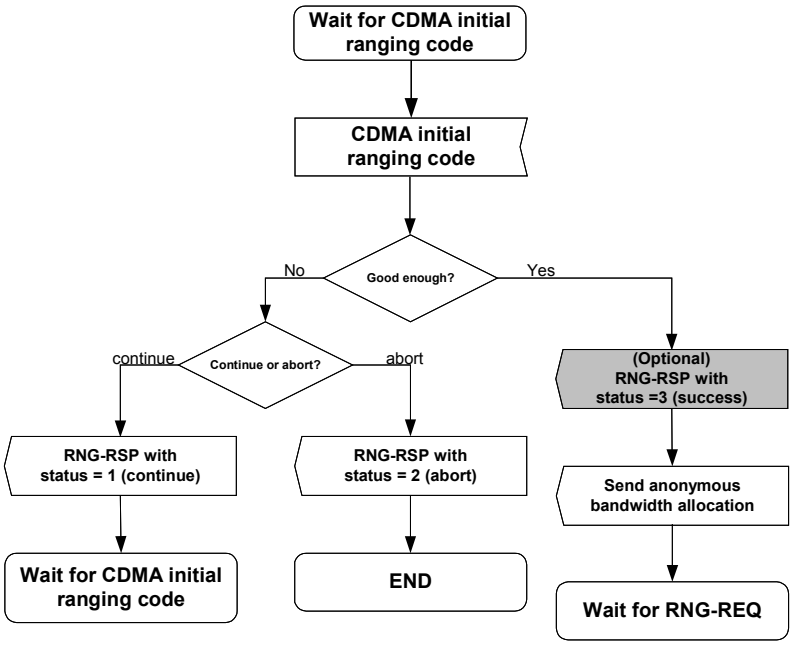


Figure 87a – Handle CDMA Initial Ranging Code at BS

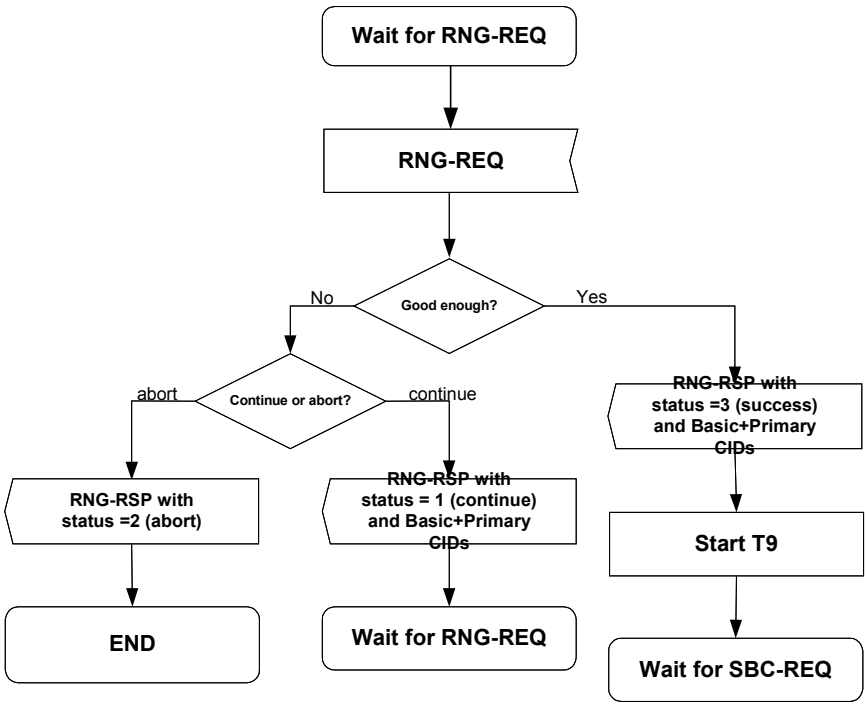


Figure 87b – Handle RNG-REQ (OFDMA PHY only)

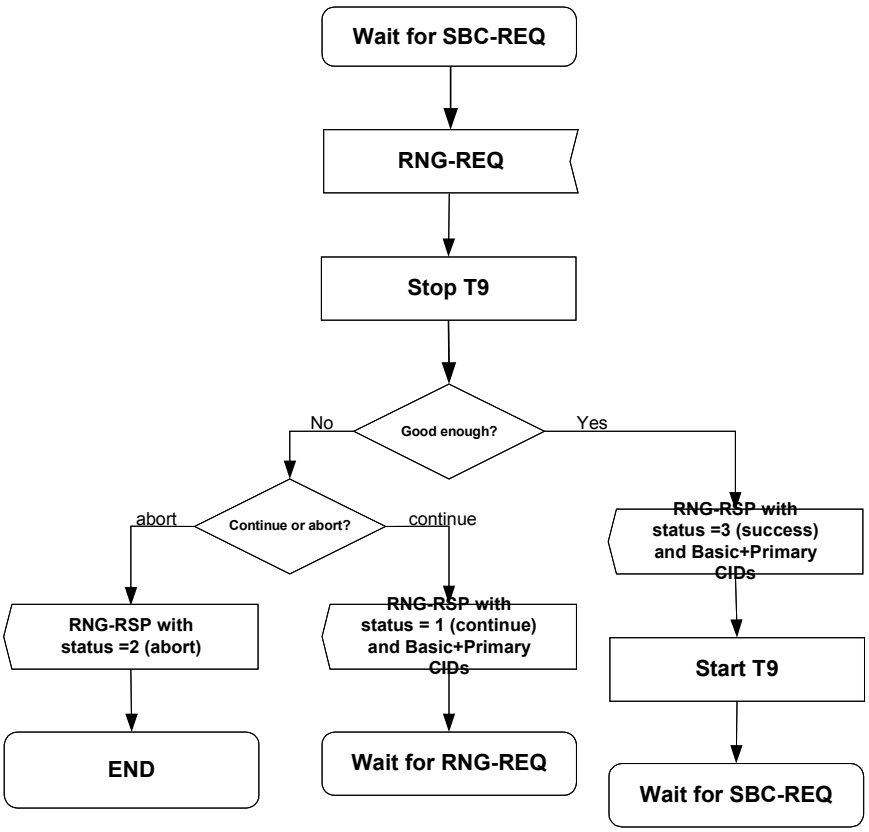


Figure 87c – Handle RNG-REQ retransmission (OFDMA PHY only)

In Cor2_D1, add the following text at the end of Section 6.3.9.9, and change Figure 70a with the following Figure 70c:

The following Figure describes the NW entry process on BS side. The transitions and states that are marked with asterisks (*) apply only to OFDMA PHY.

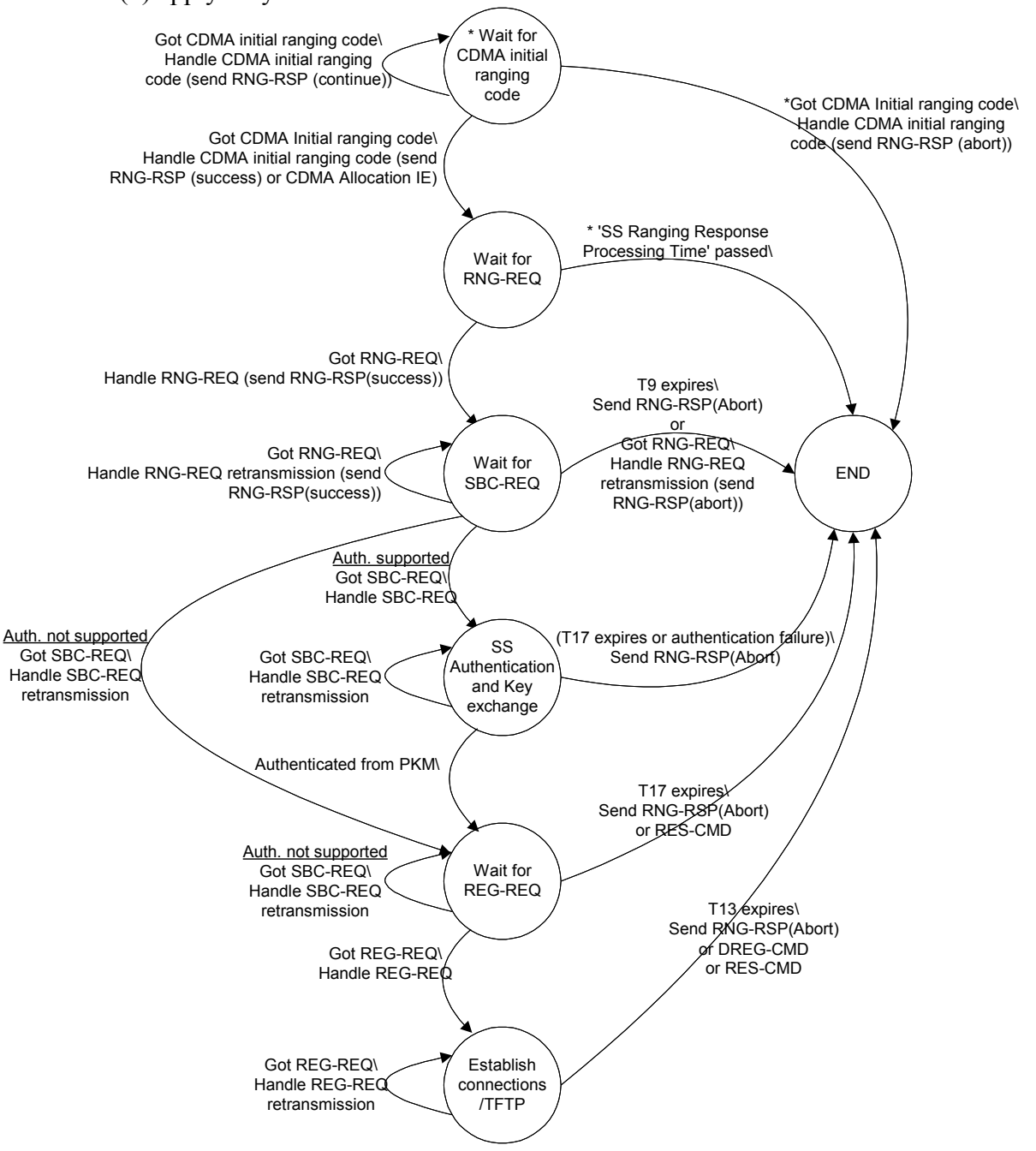


Figure 70c – Network entry state-machine BS side

In Cor2_D1, add the following text at the end of Section 6.3.9.9, and change Figure 70b with the following Figures70d:

The following Figure describes the Ranging procedure within the NW entry process on MS side. The transitions and states that are marked with asterisks (*) apply only to OFDMA PHY.

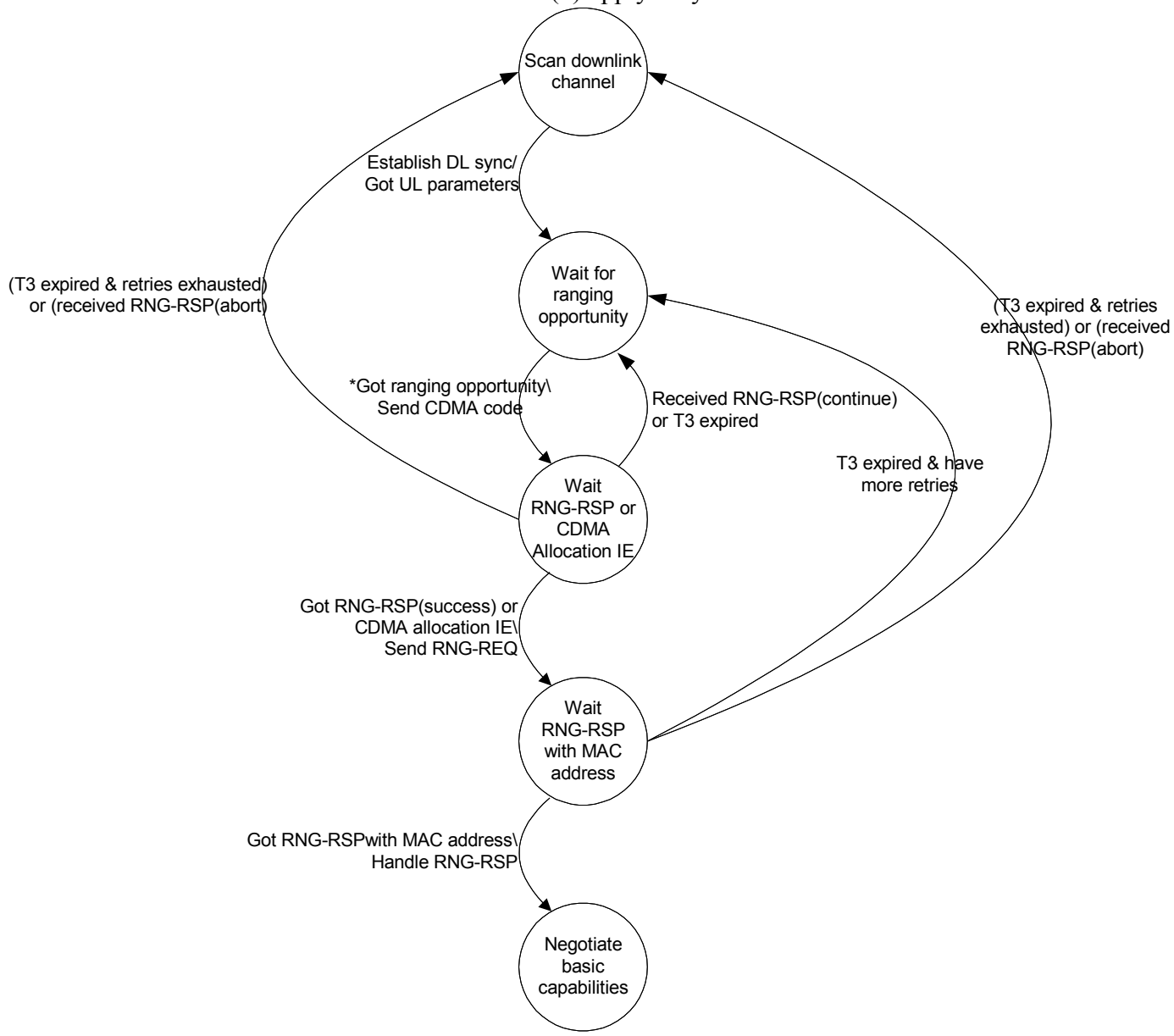


Figure 70d – Network entry state-machine SS side

In Cor2_D1, add the following text at the end of Section 6.3.9.9, and add the following Figure 70e:
The following Figure describes the Ranging procedure within the NW entry process on MS side. The transitions and states that are marked with asterisks (*) apply only to OFDMA PHY.

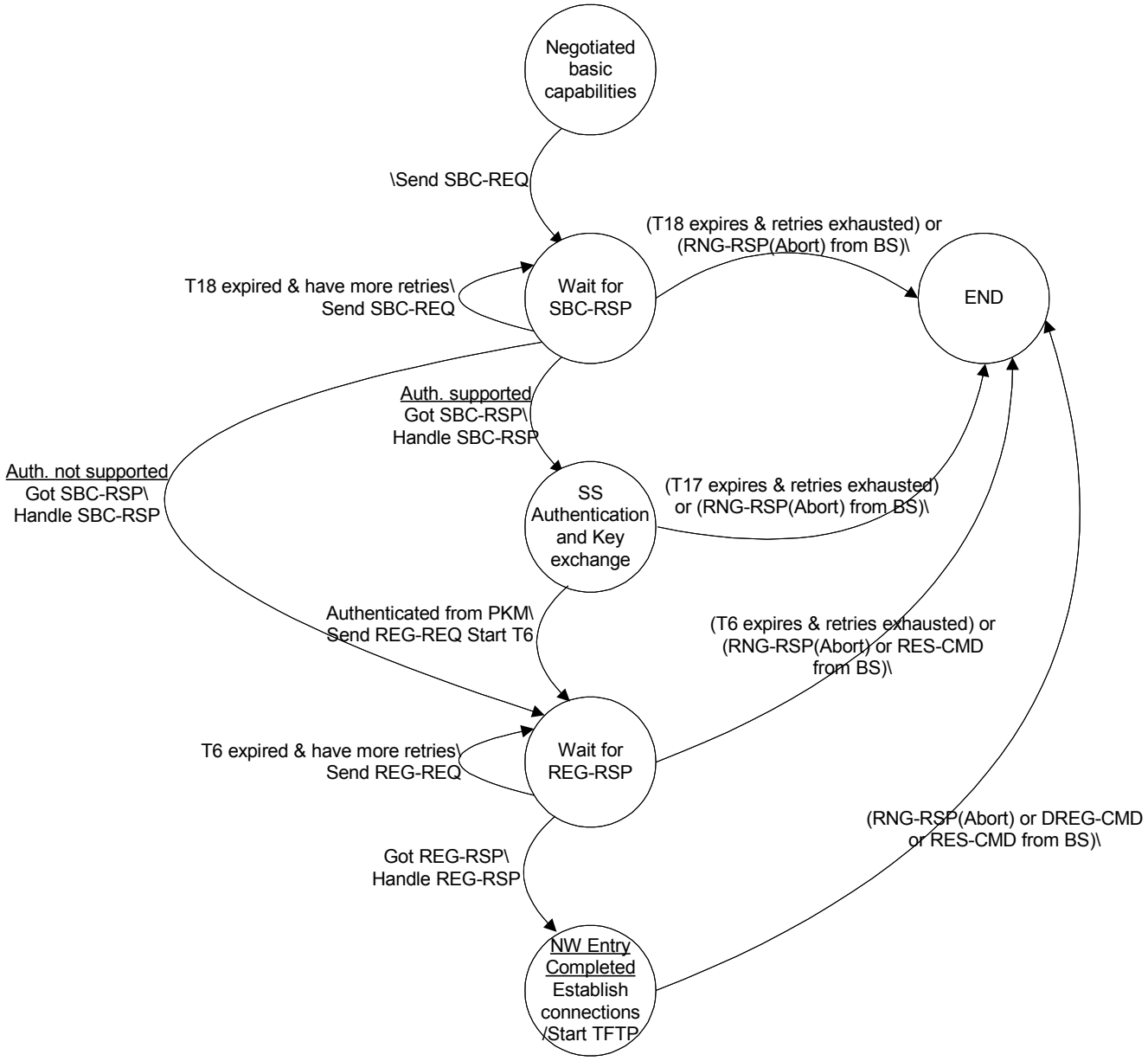


Figure 70e – Network entry state-machine SS side