Title: EPR Clarifications

Applied to: USB Power Delivery Specification Revision 3.1 Version 1.0

Brief description of the functional changes proposed:
Editorial updates to May 2021 release.
Benefits as a result of the proposed changes:
Make the spec requirements easier to understand.
An assessment of the impact to the existing revision and systems that currently conform to the USB specification:
None.
An analysis of the hardware implications:
None.
An analysis of the software implications:
None.
An analysis of the compliance testing implications:
None.

Actual Change Requested

(a). Page 358, Table 7-24

From Text:

vAvsValid	The range in addition to ***vAvsNew*** which the Adjustable Voltage Supply output is considered ***Valid*** in response to a load step.					Section 7.1.8.2

To Text:

vAvsValid	The range in addition to ***vAvsNew*** which the Adjustable Voltage Supply output is considered ***Valid*** during and after a transition as well as in response to a transient load condition.	-0.5		0.5		Section 7.1.8.2

(b). Page 359, Table 7-24

From Text:

vSrcValid	The range in addition to ***vSrcNew*** which a newly negotiated Voltage is considered ***Valid*** during and after a transition. This range also applies to ***vSafe5V***.	-0.5		0.5	V	Figure 7-2 Figure 7-3

To Text:

vSrcValid	The range in addition to ***vSrcNew*** which a newly negotiated Voltage is considered ***Valid*** during and after a transition as well as in response to a transient load condition. This range also applies to ***vSafe5V***.	-0.5		0.5	V	Figure 7-2 Figure 7-3 Section 7.1.8

(c). Section 6.5.14.1, Page 222

From Text:

The ***EPR_Get_Source_Cap*** (EPR Get Source Capabilities) Message ***Shall*** only be sent by a Sink Port that supports EPR Mode to request the Source Capabilities and Dual-Role Power capability of its Port Partner (e.g., Dual-Role Power capable). A Port that can operate as an EPR Source ***Shall*** respond by returning an ***EPR_Source_Capabilities*** Message (see Section 6.5.15.2). A port that does not support EPR Mode as a Source ***Shall*** return the ***Not_Supported*** Message.

To Text:

The ***EPR_Get_Source_Cap*** (EPR Get Source Capabilities) Message ***Shall*** only be sent by a Port capable of operating as a Sink and that supports EPR Mode to request the Source Capabilities and Dual-Role Power capability of its Port Partner. A Port that can operate as an EPR Source ***Shall*** respond by returning an ***EPR_Source_Capabilities*** Message (see Section 6.5.15.2). A port that does not support EPR Mode as a Source ***Shall*** return the ***Not_Supported*** Message.

(d). Section 6.5.14.2, Page 222

From Text:

The ***EPR_Get_Sink_Cap*** (EPR Get Sink Capabilities) Message ***Shall*** only be sent by a Source Port that supports EPR Mode to request the Sink Capabilities and Dual-Role Power capability of its Port Partner (e.g., Dual-Role Power capable). A Port that is EPR Mode capable operating as a Sink ***Shall*** respond by returning an ***EPR_Sink_Capabilities*** Message (see Section 6.5.15.3). A Port that does not support EPR Mode as a Sink ***Shall*** return the ***Not_Supported*** Message.

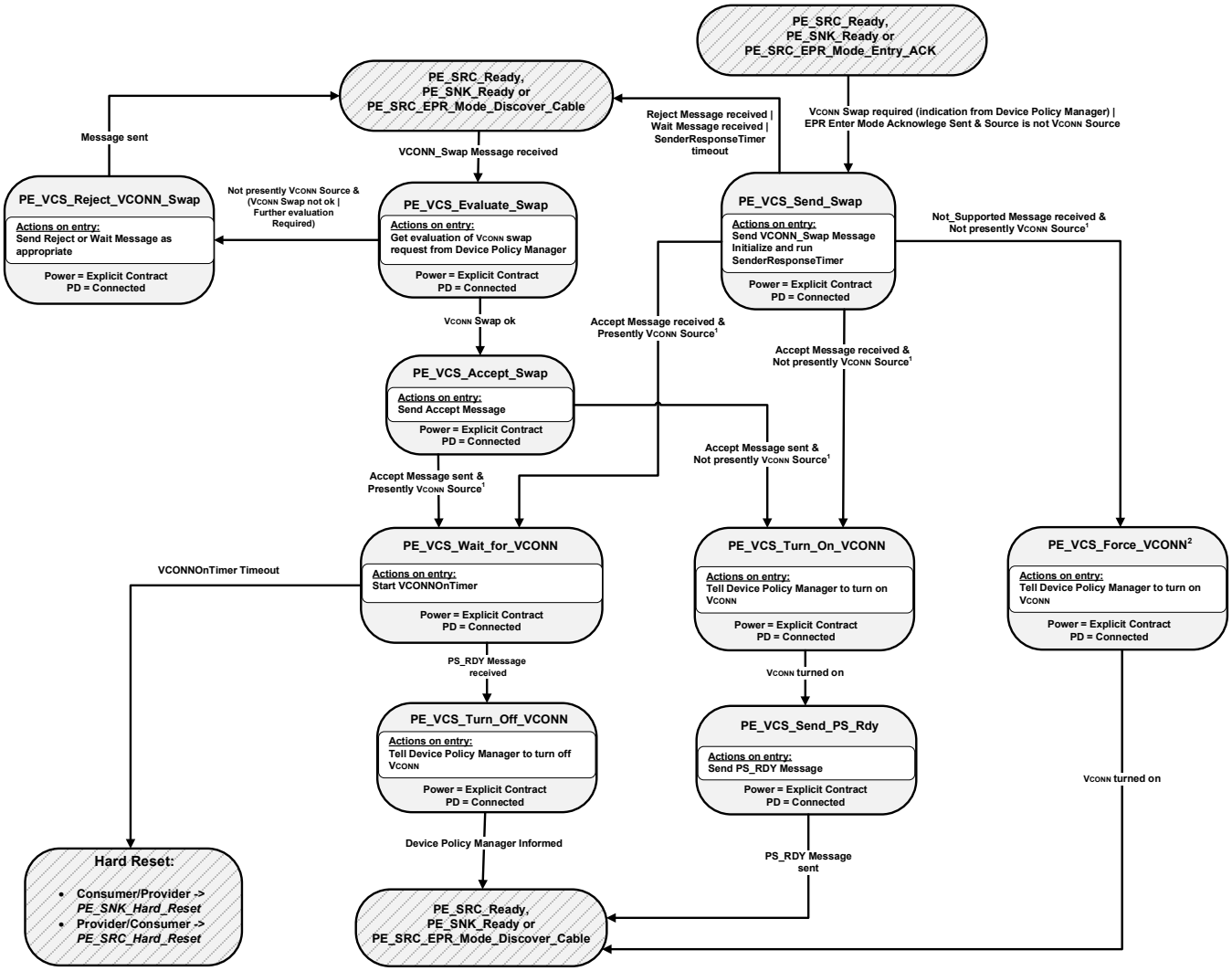
To Text:

The ***EPR_Get_Sink_Cap*** (EPR Get Sink Capabilities) Message ***Shall*** only be sent by a Port capable of operating as a Source and that supports EPR Mode to request the Sink Capabilities and Dual-Role Power capability of its Port Partner. A Port that is EPR Mode capable operating as a Sink ***Shall*** respond by returning an ***EPR_Sink_Capabilities*** Message (see Section 6.5.15.3). A Port that does not support EPR Mode as a Sink ***Shall*** return the ***Not_Supported*** Message.

(e). Page 626, Figure 8-135

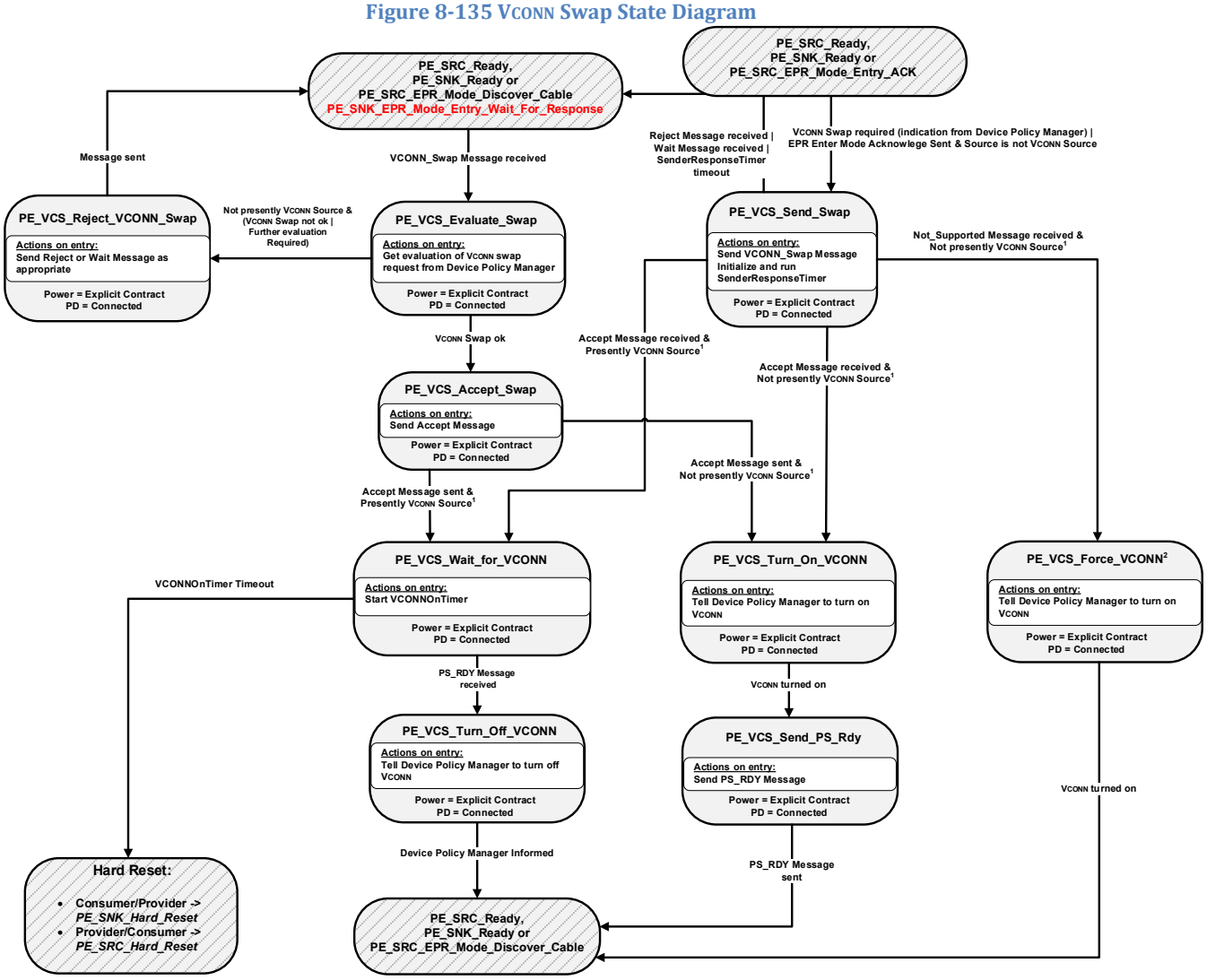
From Text:

Figure 8-135 VCONN Swap State Diagram



To Text:

Figure 8-135 VCONN Swap State Diagram



(f). Section 8.3.3.19.1, Page 826

From Text:

The ***PE_VCS_Send_Swap*** state is entered from either the ***PE_SRC_Ready*** or ***PE_SNK_Ready*** state when the Policy Engine receives a request from the Device Policy Manager to perform a VCONN Swap.

The ***PE_VCS_Send_Swap*** state is entered from the ***PE_SRC_EPR_Mode_Discover_Cable*** state when:

- The Source is not the VCONN Source and
- The ***EPR_Mode*** (Enter Acknowledged) Message has been sent.

On entry to the ***PE_VCS_Send_Swap*** state the Policy Engine ***Shall*** send a ***VCONN_Swap*** Message and start the ***SenderResponseTimer***.

The Policy Engine ***Shall*** transition to the ***PE_VCS_Wait_For_VCONN*** state when:

- An ***Accept*** Message is received and
- The Port is presently the VCONN Source.

The Policy Engine ***Shall*** transition to the ***PE_VCS_Turn_On_VCONN*** state when:

- An ***Accept*** Message is received and
- The Port is not presently the VCONN Source.

The Policy Engine ***Shall*** transition back to either the ***PE_SRC_Ready***, ***PE_SNK_Ready*** or ***PE_SRC_EPR_Mode_Discover_Cable*** state when:

- A ***Reject*** Message is received or
- A ***Wait*** Message is received or
- The ***SenderResponseTimer*** times out.

The Policy Engine ***May*** transition to the ***PE_VCS_Force_VCONN*** state when:

- A ***Not_Supported*** Message is received and
- The Port is not presently the VCONN Source.

To Text:

The ***PE_VCS_Send_Swap*** state is entered from either the ***PE_SRC_Ready*** or ***PE_SNK_Ready*** state when the Policy Engine receives a request from the Device Policy Manager to perform a VCONN Swap.

The ***PE_VCS_Send_Swap*** state is entered from the ***PE_SRC_EPR_Mode_Discover_Cable*** state when:

- The Source is not the VCONN Source and
- The ***EPR_Mode*** (Enter Acknowledged) Message has been sent.

The ***PE_VCS_Evaluate_Swap*** state is entered from the ***PE_SNK_EPR_Mode_Wait_For_Response*** State when:

- The Sink is the VCONN Source and
- The ***EPR_Mode*** (Enter Acknowledged) Message has been received.

On entry to the ***PE_VCS_Send_Swap*** state the Policy Engine ***Shall*** send a ***VCONN_Swap*** Message and start the ***SenderResponseTimer***.

The Policy Engine ***Shall*** transition to the ***PE_VCS_Wait_For_VCONN*** state when:

- An ***Accept*** Message is received and
- The Port is presently the VCONN Source.

The Policy Engine ***Shall*** transition to the ***PE_VCS_Turn_On_VCONN*** state when:

- An ***Accept*** Message is received and
- The Port is not presently the VCONN Source.

The Policy Engine ***Shall*** transition back to either the ***PE_SRC_Ready***, ***PE_SNK_Ready*** or ***PE_SRC_EPR_Mode_Discover_Cable*** state when:

- A ***Reject*** Message is received or
- A ***Wait*** Message is received or
- The ***SenderResponseTimer*** times out.

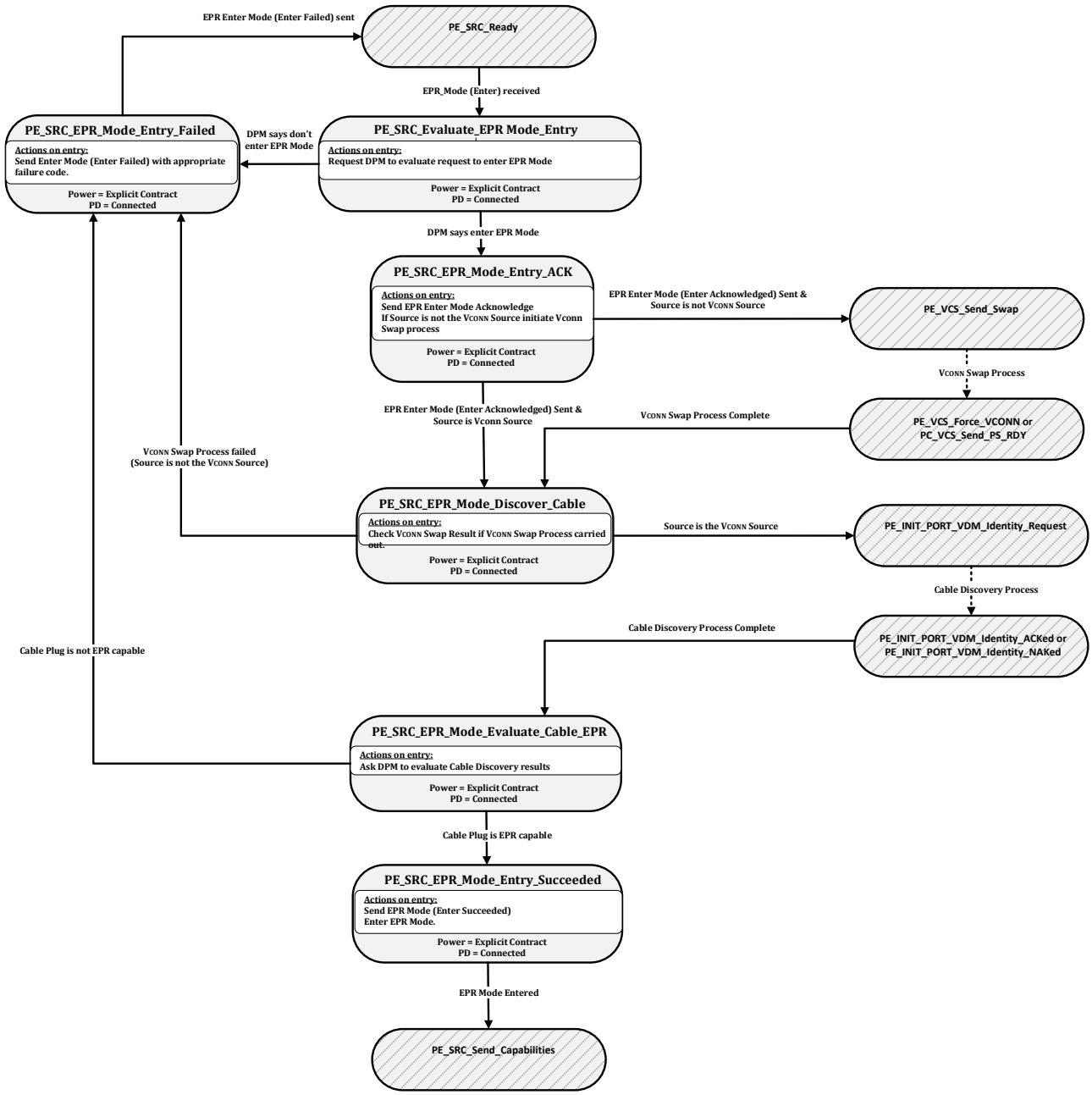
The Policy Engine ***May*** transition to the ***PE_VCS_Force_VCONN*** state when:

- A ***Not_Supported*** Message is received and
- The Port is not presently the VCONN Source.

(g). Page 650, Figure 8-156

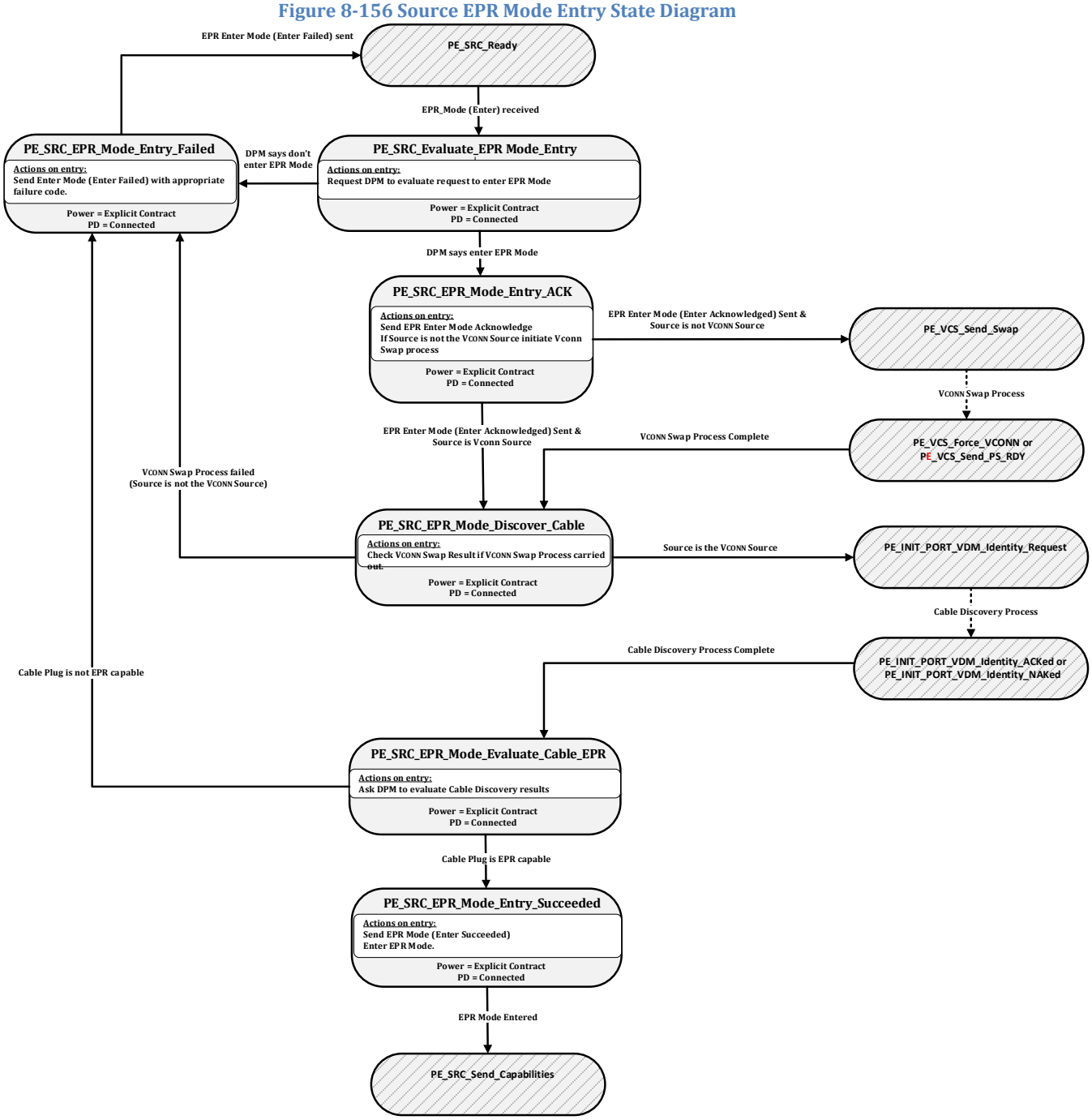
From Text:

Figure 8-156 Source EPR Mode Entry State Diagram



To Text:

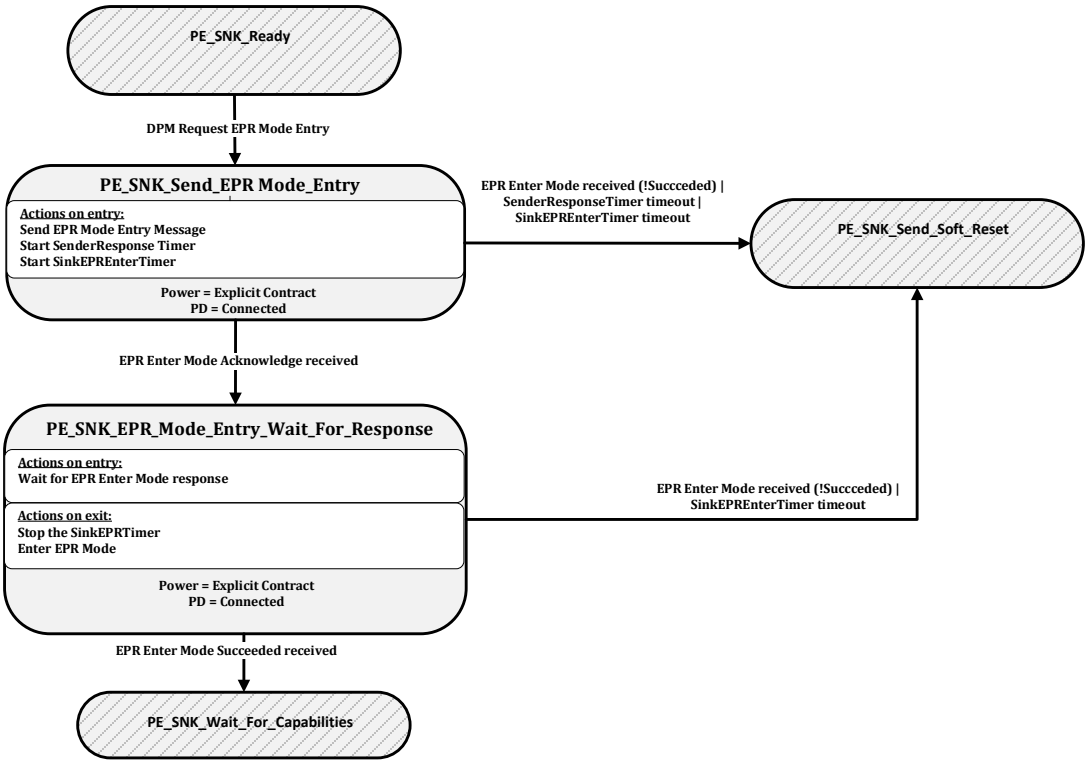
Figure 8-156 Source EPR Mode Entry State Diagram



(h). Page 652, Figure 8-157

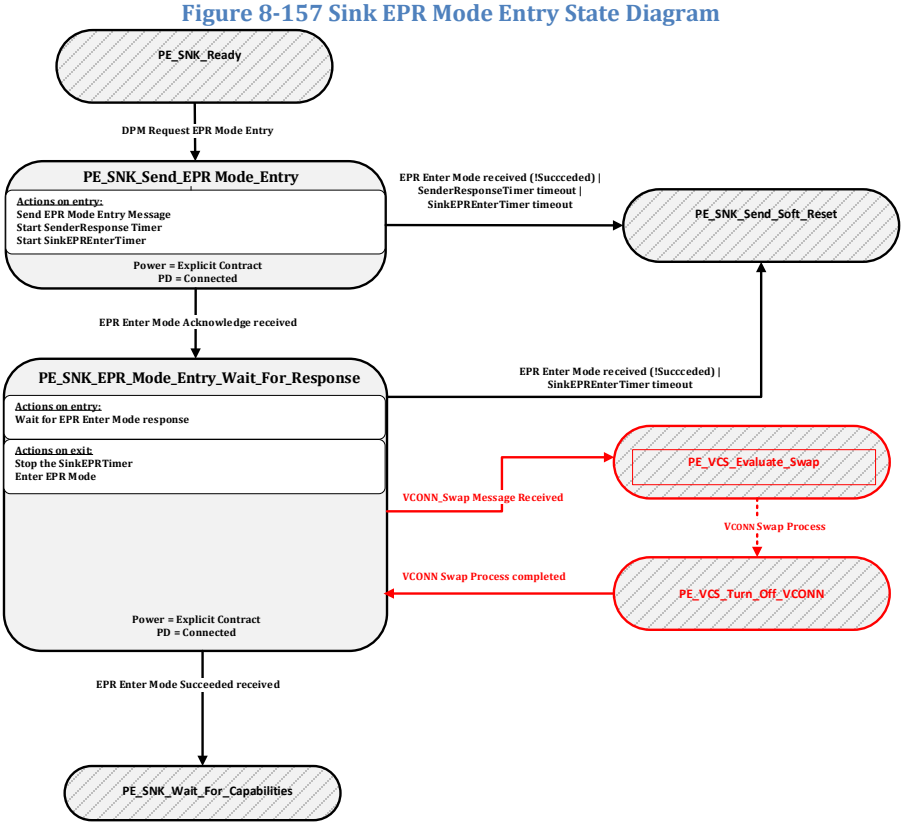
From Text:

Figure 8-157 Sink EPR Mode Entry State Diagram



To Text:

Figure 8-157 Sink EPR Mode Entry State Diagram



(i). Section 8.3.3.25.2.2, Page 653

From Text:

In the State the Policy Engine waits for a confirmation that the EPR Mode entry request has succeeded.

On exit from the ***PE_SNK_EPR_Mode_Wait_For_Response*** state the Policy Engine ***Shall*** stop the ***SinkEPREnterTimer*** and enter EPR Mode.

The Policy Engine ***Shall*** transition to the ***PE_SNK_Wait_for_Capabilities*** state when:

- An ***EPR_Mode*** (Enter Succeeded) Message has been received.

The Policy Engine ***Shall*** transition to the ***PE_SNK_Send_Soft_Reset*** state when:

- An ***EPR_Mode*** Message is received which is not Enter Succeeded or
- The ***SinkEPREnterTimer*** times out.

To Text:

In the State the Policy Engine waits for a confirmation that the EPR Mode entry request has succeeded.

On exit from the ***PE_SNK_EPR_Mode_Wait_For_Response*** state the Policy Engine ***Shall*** stop the ***SinkEPREnterTimer*** and enter EPR Mode.

The Policy Engine ***Shall*** transition to the ***PE_SNK_Wait_for_Capabilities*** state when:

- An ***EPR_Mode*** (Enter Succeeded) Message has been received.

The Policy Engine ***Shall*** transition to the ***PE_SNK_Send_Soft_Reset*** state when:

- An ***EPR_Mode*** Message is received which is not Enter Succeeded or
- The ***SinkEPREnterTimer*** times out.

The Policy Engine ***Shall*** transition to the ***PE_VCS_Evaluate_Swap*** state when:

- A ***VCONN_Swap*** Message is received.

The Policy Engine ***Shall*** transition back from the ***PE_VCS_Turn_Off_VCONN*** State to the ***PE_SNK_EPR_Mode_Wait_For_Response*** State when:

- The Vconn Swap process has completed.

(j). Table 6-67, Page 667

From Text:

tEnterEPR			500	ms	Section 6.6.21.1

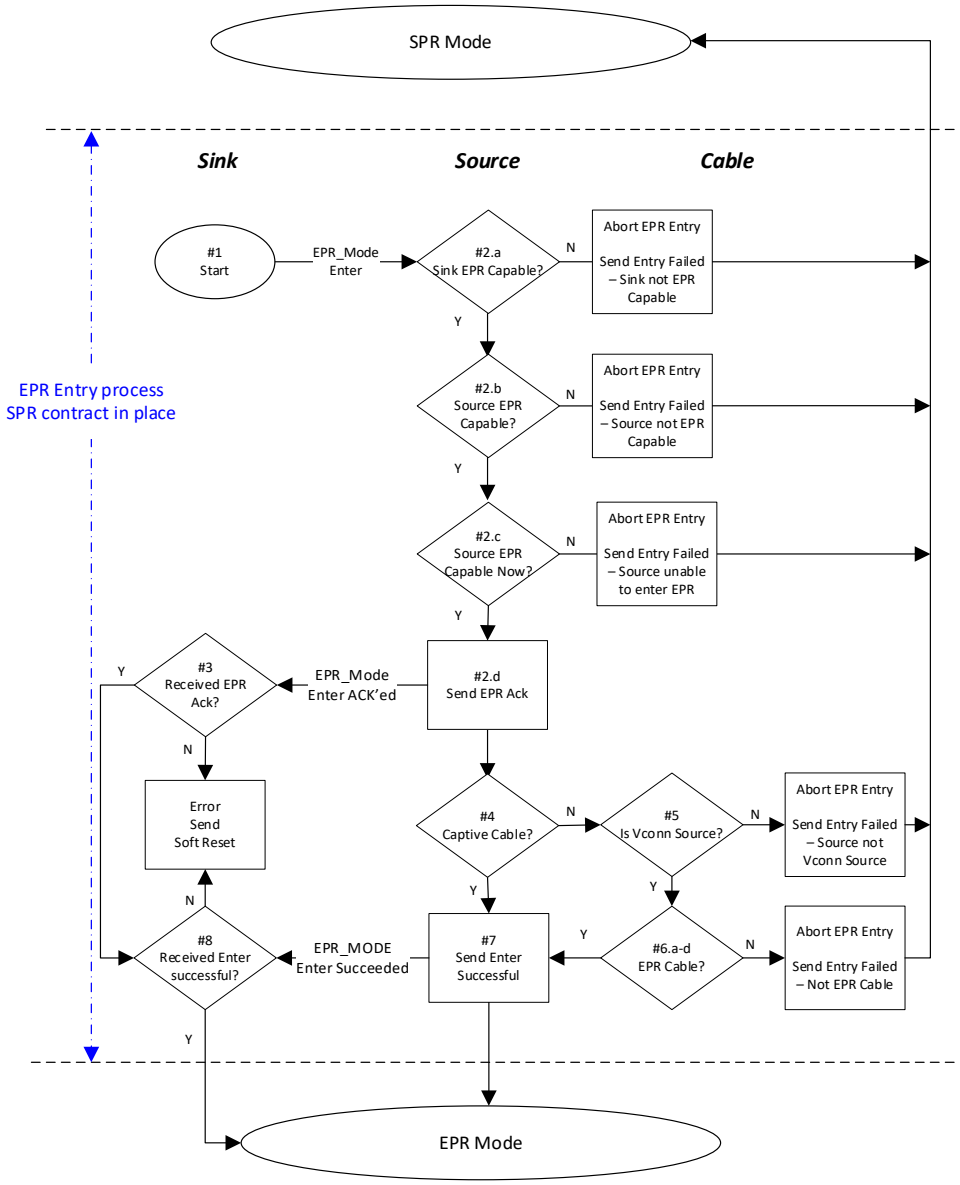
To Text:

tEnterEPR	450	500	550	ms	Section 6.6.21.1

(k). Figure 6-34, Page 196

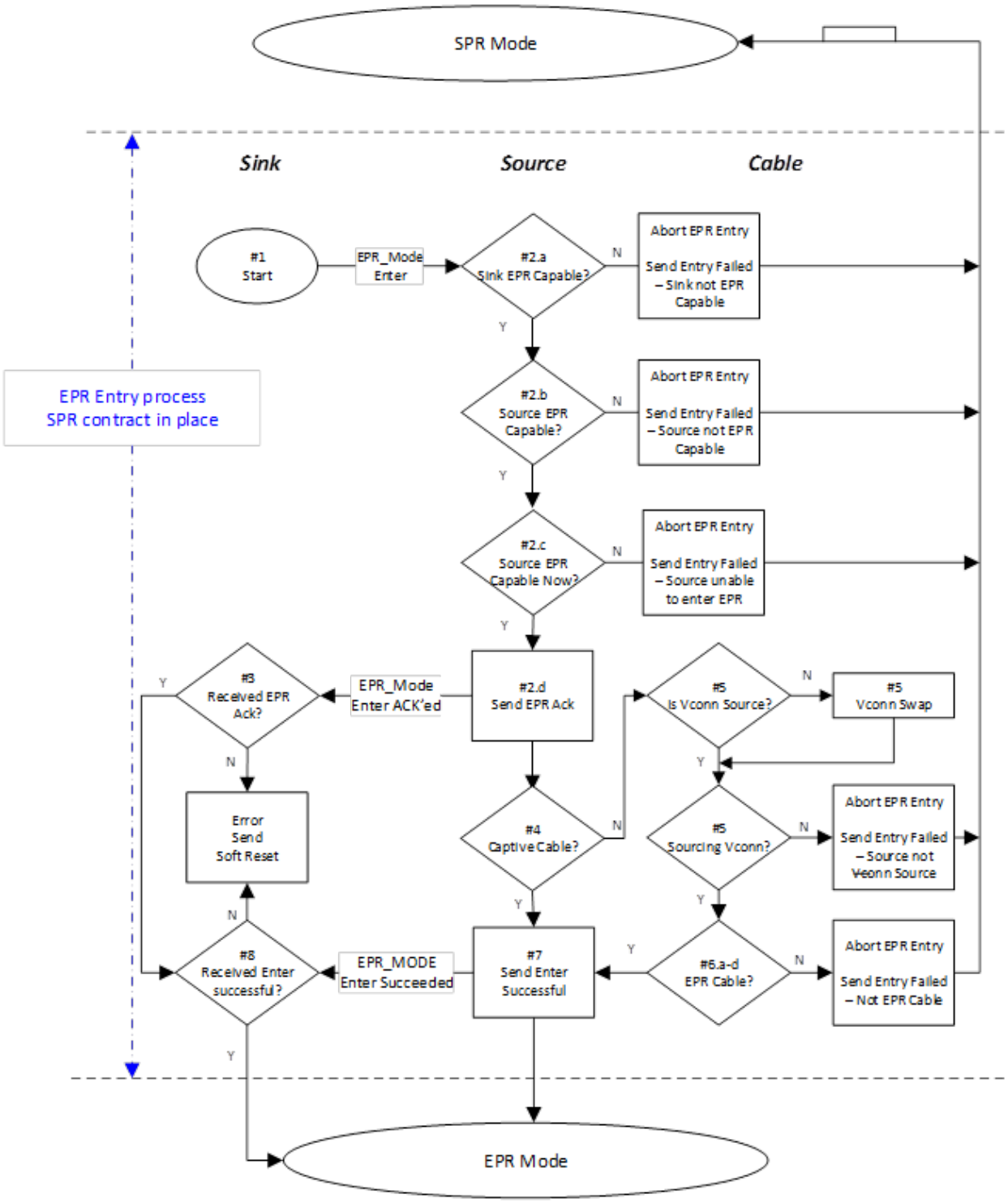
From Text:

Figure 6-1 Illustration of process to enter EPR Mode



To Text:

Figure 6-34 Illustration of process to enter EPR Mode



(l). Section 1.6, Page 64

From Text:

PD Power (PDP)	The output power of a Source, as specified by the manufacturer and expressed in Fixed Supply PDOs as defined in Section 10.

To Text:

PD Power (PDP)	The output power in Watts of a Source, as specified by the manufacturer and expressed in Fixed Supply PDOs as defined in Section 10.