Project	**IEEE 802.16 Broadband Wireless Access Working Group** <http://ieee802.org/16>
Title	**Improve Sleep HO Context management**
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Re:	IEEE 802.16 Letter Ballot Recirculation #26d, on P802.16Rev2/D5, as per IEEE 802.16-08/029
Abstract	The sleep context and sleep operations during HO are not clearly defined in the spec. The proposed clarification defines the sleep termination details for HO operations.
Purpose	Discuss and adopt
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Improve Sleep HO Context management

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Background

The sleep context and operation during HO are not clearly defined in the spec. It is not defined in the spec when the devices will terminate sleep mode during HO. In the case of MS-initiated HO it is reasonable to do this at the beginning of HO negotiation to speed up the HO negotiation and provide fast opportunity for BS to transmit MOB_BSHO-RSP. In the case of BS-initiated HO the BS will send MOB_BSHO-REQ at listening interval, and it is also reasonable that the sleep mode is terminated immediately to support fast HO negotiation and HO Action time proper scheduling of HO process.

The spec also explicitly requires MS and Serving BS to retain PSC context during HO in section 6.3.22.2.8.1.6.7. The spec is silent what to do with retained PSC data after HO cancellation. To prevent misinterpretation of the spec, which may cause automatic sleep mode activation expectation, the opportunity for the sleep mode activation after HO cancellation should be defined explicitly. This kind of MS and BS behavior clarification does not present in the spec.

The problems of PSC definition synchronization, which may occur as a result of packet loss during HO or as a result of non-coordinated HO may be resolved permitting the MS to send complete PSC definition after HO cancellation for the mentioned cases.

Proposed Changes

The proposed clarification defines the sleep termination details for HO operations.

Proposed Changes in 802.16Rev2/D5

[On page 429, Section “6.3.21.1 Introduction”, modify 17th paragraph:]
The MS and the serving BS shall ~~stop the sleep mode~~ locally deactivate all PSCs when sending or receiving a MOB_HO-IND, MOB_MSHO-REQ or MOB_BSHO-REQ message and before handover to the target BS.

[On page 458, Section “6.3.22.2.8.1.6.7 Power Saving Class settings”, modify 4th paragraph:]
The MS shall ~~exit sleep mode,~~ locally deactivate all active Power Saving Classes to perform HO. The MS and the serving BS shall not initiate new sleep transactions during HO negotiation. If there is some ongoing MS-initiated sleep transaction when HO negotiation starts and the MS receives the MOB_SLP-RSP message before transmitting the MOB_HO-IND message, the MS shall successfully complete this transaction accepting all PSC definitions from MOB_SLP-RSP message, but shall not activate any PSCs. If the MOB_SLP-RSP message is not received before handover to the target BS or before expiration of timer T43, the MS shall terminate the sleep transaction. If the serving BS receives MOB_SLP-REQ message after HO negotiation has started and before HO cancellation, the serving BS shall reject PSC definition(s) and shall not send MOB_SLP-RSP

message.

MS may reenter sleep mode, upon HO completion at the target BS, by transmitting a MOB_SLP-REQ message, which shall include all requested Power Saving Class configurations. If the MS cancels HO and returns to normal operation with its previous serving BS, it may re-enter sleep mode by activating retained PSC configurations. The MS should not include the definition of a retained Power Saving Class in a MOB_SLP-REQ message after HO cancellation unless some sleep transaction was terminated by the MS during HO.