



Patent Owner's Oral Argument Presentation[†]

***Nokia of America Corp. et al. v. Iarnach Technologies, Inc.,
Case No. IPR2024-00899
re U.S. Patent No. 9,806,892***

September 18, 2025

Before Kevin C. Trock, Kara L. Szpondowski, and Christopher L. Ogden,
Administrative Patent Judges

Presented by Joshua Wyde,
Counsel for Patent Owner

EXHIBIT
ITL
2011

[†] DEMONSTRATIVE EXHIBIT—NOT EVIDENCE; All highlighting/annotation/emphasis added unless otherwise indicated

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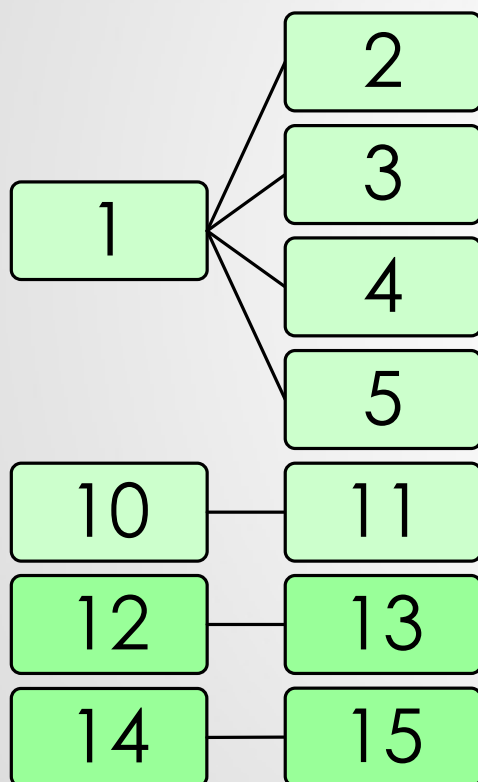
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Claims and Issues

1: Prior Art Does Not Render Direct Transitions Obvious

1

All Claims:[†] Petitioners fail to show a POSITA would modify G.987.3 in view of Röger in the way Petitioners contend, so do not show any challenged claim requiring the direct transition limitations obvious



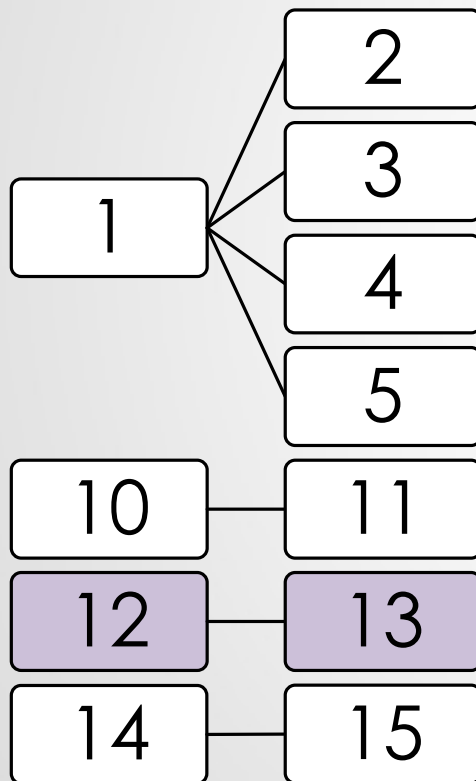
No.	Limitation
1D	transitioning the ONU directly from the first state to the second state and transitioning the ONU directly from the second state to the first state, based on a power management rule;
10D	wherein the processor includes means for transitioning the ONU directly from the first state to the second state and means for transitioning the ONU directly from the second state to the first state, based on a power management rule;
12B	a processor configured to generate messages for controlling a transition of an optical network unit from a first low power state in which a receiver of the optical network unit is turned on but a transmitter of the optical network unit is turned off to a second low power state in which both the receiver and the transmitter of the optical network unit are turned off;
14B	an optical network unit (ONU) operable in a first low power mode in which the ONU is able to receive but not transmit and a second low power mode in which the ONU is not able to either receive or transmit, wherein the ONU is configured to transition from the first low power mode to the second low power mode and to transition from the second low power mode to the first low power mode based on a power management rule, and wherein the ONU changes a power management rule based on a received power management message;

[†] Claim construction dependent as to whether Claims 12 and 14 require direct transitions

2: No Consent Messages to Remain in Low Power State

2

Claim 12 and 13:[†] Petitioners have not shown OLT generated messages comprise a periodic “consent message” to allow the ONU to remain in either the first or second low power state



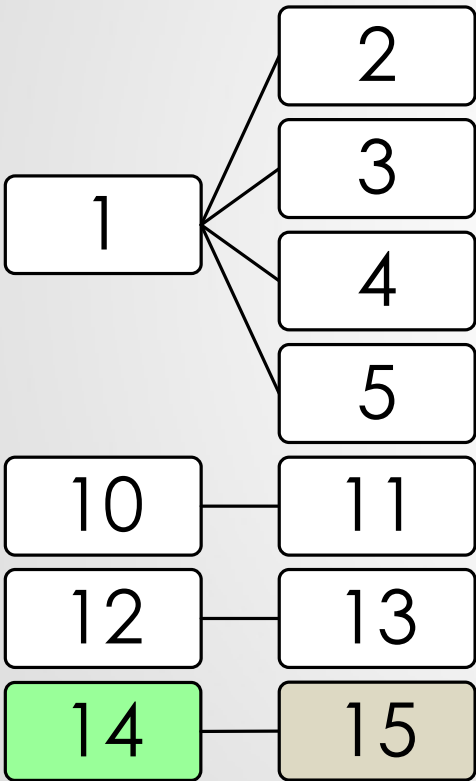
No.	Limitation
12D	wherein the generated messages comprises a periodic consent message to allow the optical network unit <u>to remain</u> in either the first low power state or the second low power state.

[†] Do not have to determine whether claim 12 requires direct transition if Panel sides with Patent Owner

3: No Power Management Rule with Two Time Periods

3

Claim 15:[†] Petitioners are incorrect that two separate messages with power management rules meets this limitation



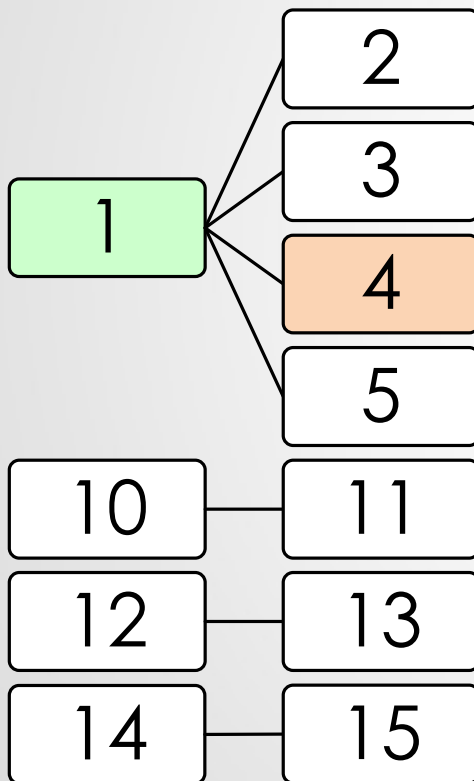
No.	Limitation
14C	an optical line terminal (OLT) communicably coupled to the ONU, the OLT configured to transmit a control message to the ONU to control at least one aspect of transition of the ONU between the first low power mode and the second low power mode; and
15	15. The system as in claim 14, wherein: the OLT is configured to transmit the control message that includes <u>the power management rule that specifies a first time period for operation in the first low power state and a second time period for operation in the second low power state</u> and to control the ONU to transition from the first low power state to the second low power state upon expiration of at least one of the first time period and the second time period.

[†] Do not need to reach this argument if Panel sides with P.O. regarding Claim 14’s non-obviousness

4: No Transmission of Message Indicative of Transition

4

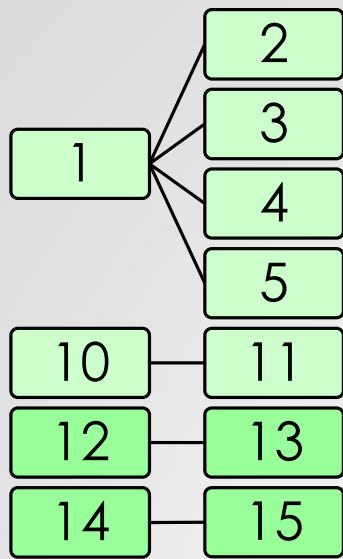
Claim 4:[†] Petitioners do not show how or why an ONU could and should send a message for the disallowed transitions



No.	Limitation
4	4. The method of claim 1, further comprising: transmitting, to an optical line terminal, a message indicative of the transitioning between the first state and the second state.

[†] Do not need to reach this argument if Panel sides with P.O. regarding Claim 1's non-obviousness

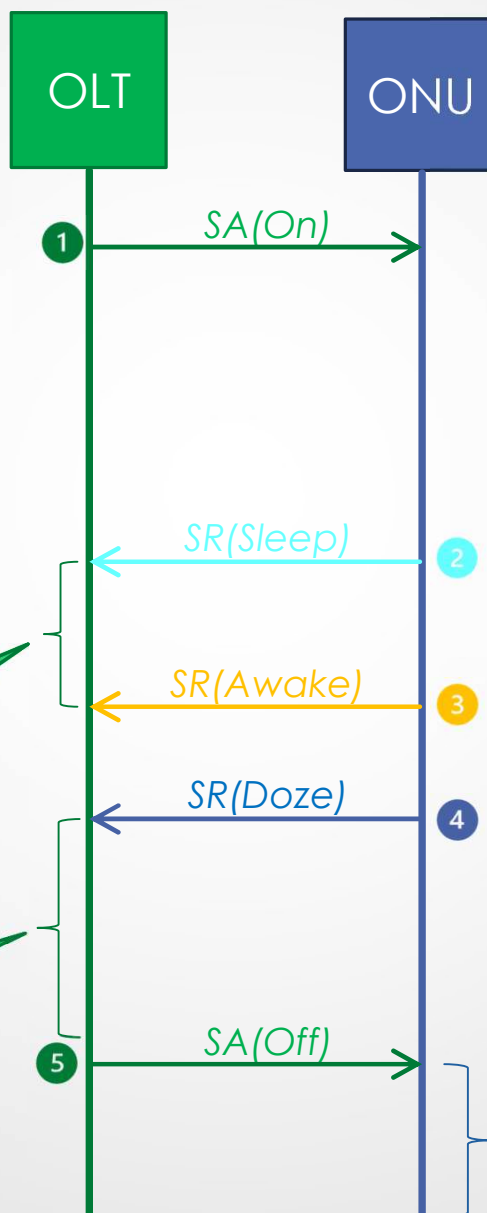
Petitioners Do Not Show Unpatentability over G.987.3 in view of Röger



Petitioners' Direct Transition Modification Is Incompatible with G.987.1's Fundamental Design

G.987.3's OLT Tracks ONU Sleep and Doze Power States

PON



OLT may **not** forward downstream data

OLT may **forward** downstream data

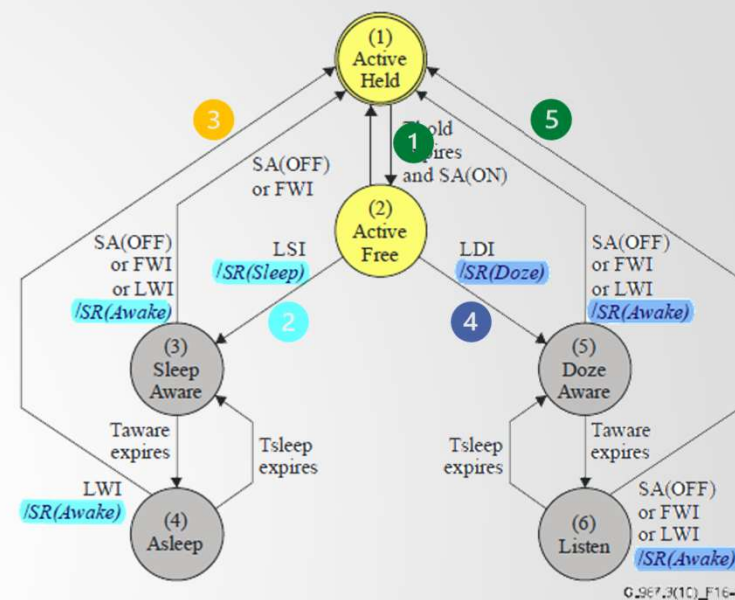


Figure 16-1 – ONU state transition diagram (initial state circled)

Ex. 1007 at 101
(blue highlighting and numbering added)

ONU may not enter doze or sleep

POR 27–28; Sur-Reply 6–8, 11

Figure 16-2 – OLT state transition diagram (initial state circled)

Ex. 1007 at 104
(green highlighting and numbering added)

ONU Cannot Request Direct Sleep-Doze Transition

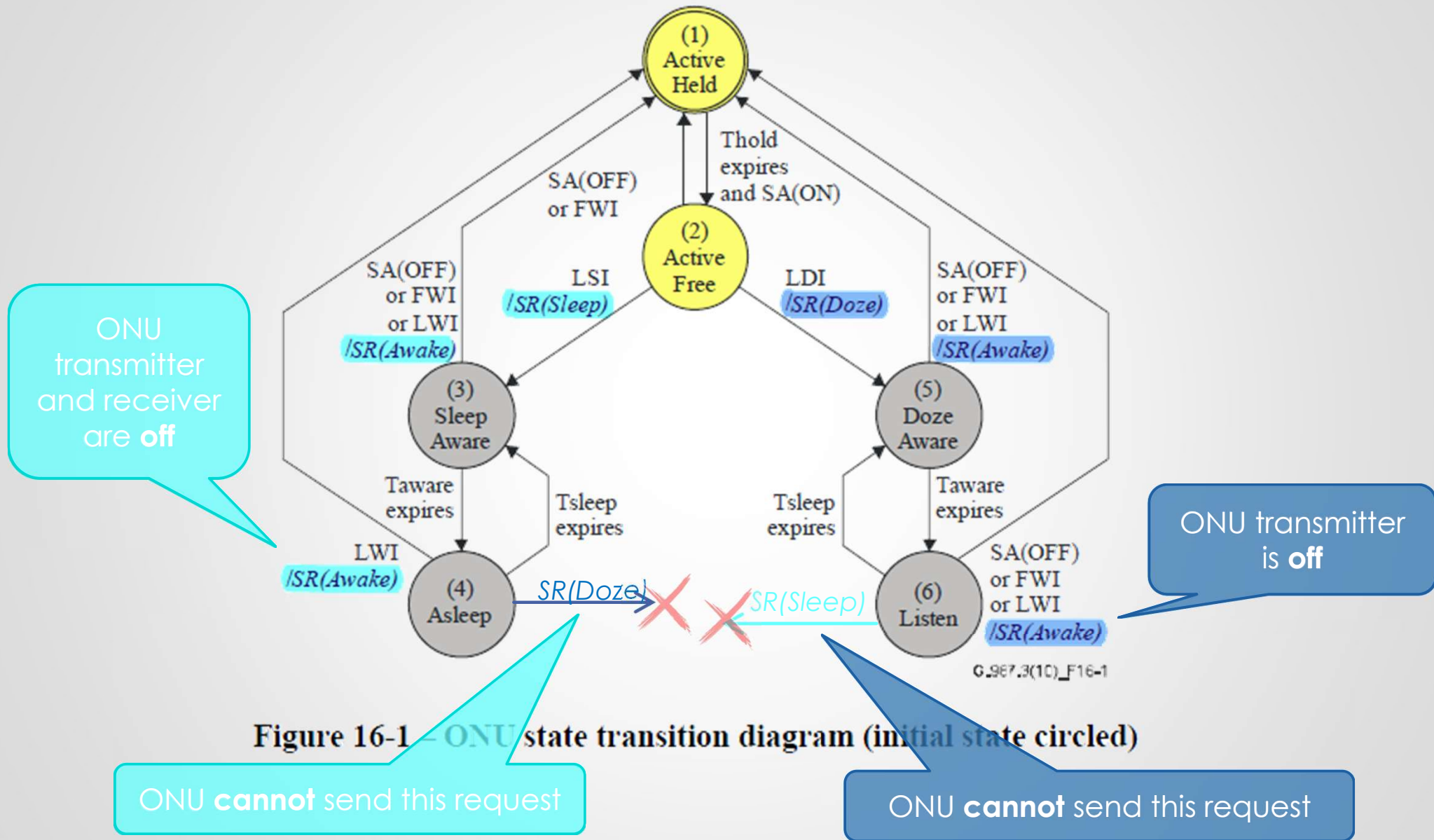


Figure 16-1 – ONU state transition diagram (initial state circled)

ONU Doze & Sleep Are Mutually Exclusive

In a system supporting both doze mode and cyclic sleep mode, each low-power cycle is nevertheless characterized by either doze or sleep behaviour, but not both. At the start of each cycle, the parties negotiate whether the ONU will doze or sleep.

Ex. 1041 at 1

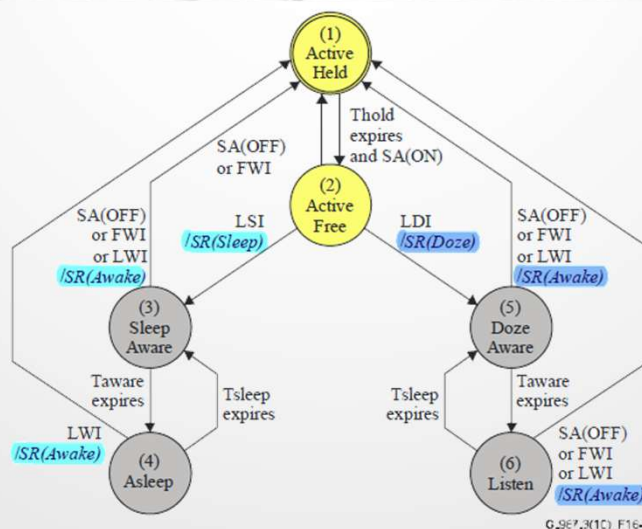


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requesting permission to enter the Cyclic sleep mode. The OLT needs to know which of the low power modes the ONU is intending to enter, if given permission, because the particular low power state will determine if the OLT can still continue to send downstream data (Doze mode) or not (Cyclic Sleep mode) to the ONU in the low power mode.

Ex. 2007 ¶196; see also Ex. 1036 at 114:8–22 & Ex. 1037 at 2

In cyclic sleep mode the OLT **cannot** forward downstream data



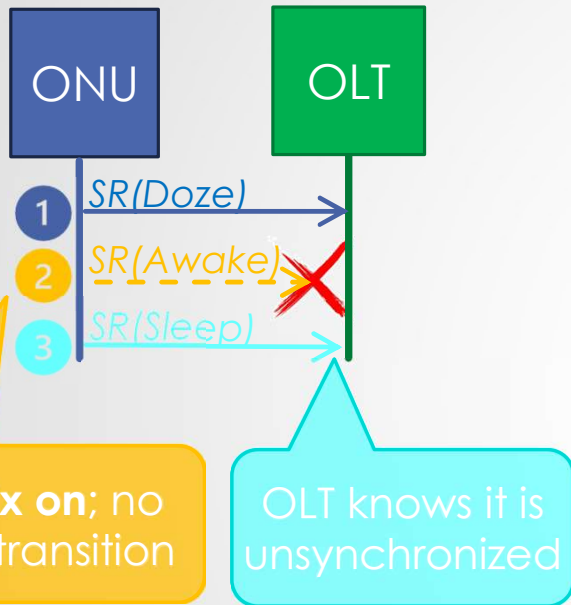
In doze mode the OLT **may** continue to send downstream data

Figure 16-1 – ONU state transition diagram (initial state circled)

Ex. 1007 at 101 (blue added)

POR 27–28; Sur-Reply 6–7

Receiving Prohibited Transition Means Sync Is Lost



State ONU is in after ②

State OLT thinks ONU is in after ②

Table 16-7 – OLT state transition and output table

Inputs	OLT power management states					
	(1) Awake Forced	(2) Awake Free	(3) Low Power Sleep	(4) Alerted Sleep / FWI	(5) Low Power Doze	(6) Alerted Doze / FWI
SR (Awake)	*	*	→ (2)	→ (1)	→ (2)	→ (1)
SR (Sleep)	* /SA(OFF) (Note 1)	→ (3)	*	*	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)
SR (Doze)	* /SA(OFF) (Note 1)	→ (5)	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)	*	*

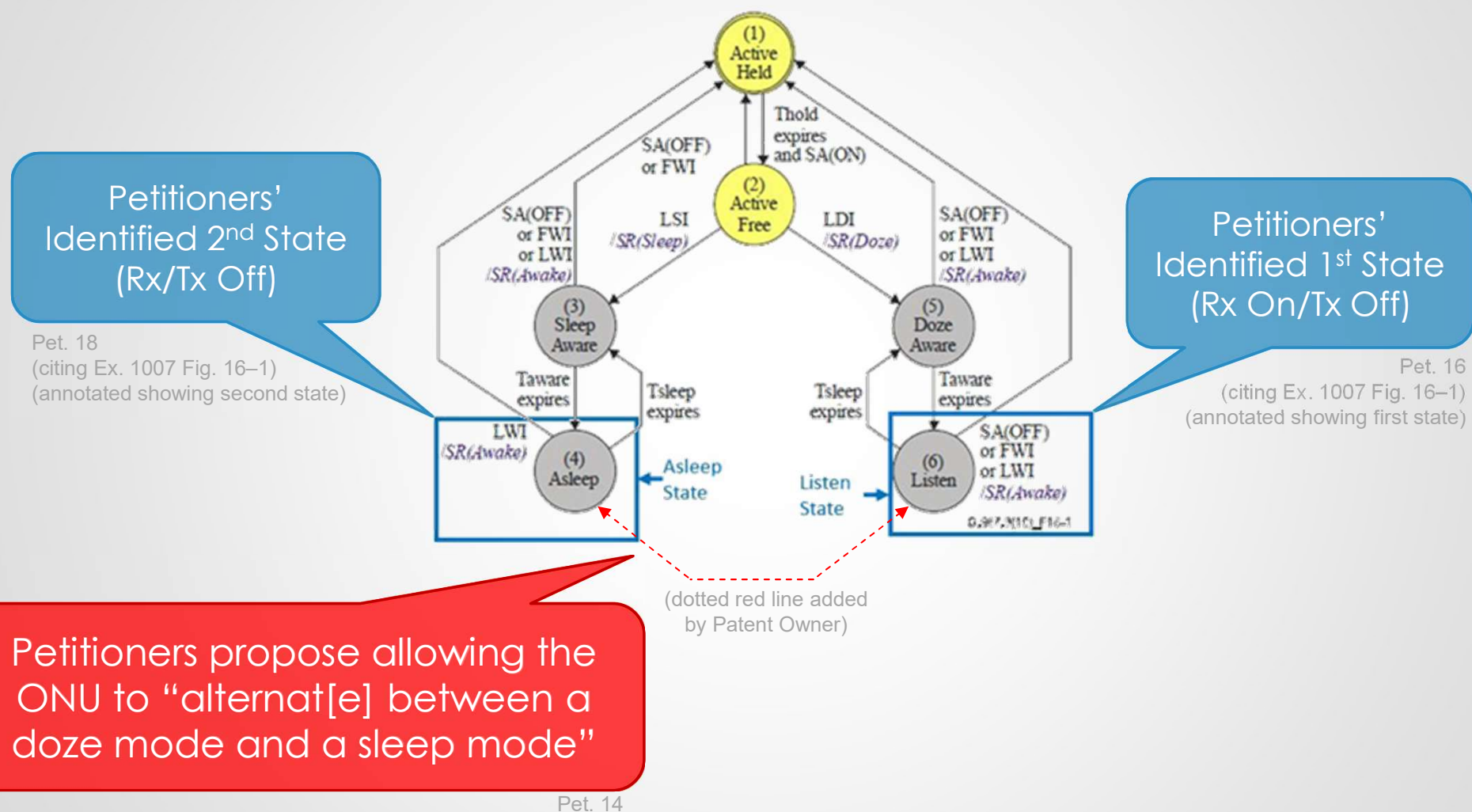
NOTE 2 – Direct transitions between Doze mode and Cyclic Sleep mode are disallowed. When the OLT receives a request to execute such a transition, it attempts to regain state machine synchronization by waking up the ONU. The transitions are not shown on the diagram for the sake of compactness.

Ex. 1007 at 102 Tbl. 16-7 (shown in part and annotated)

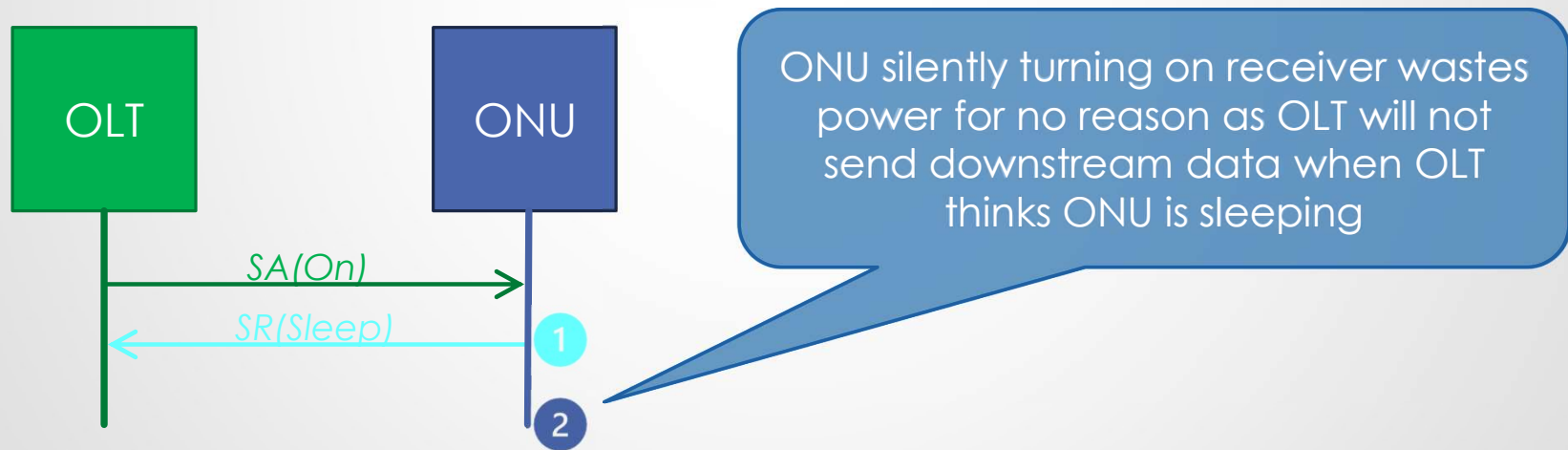
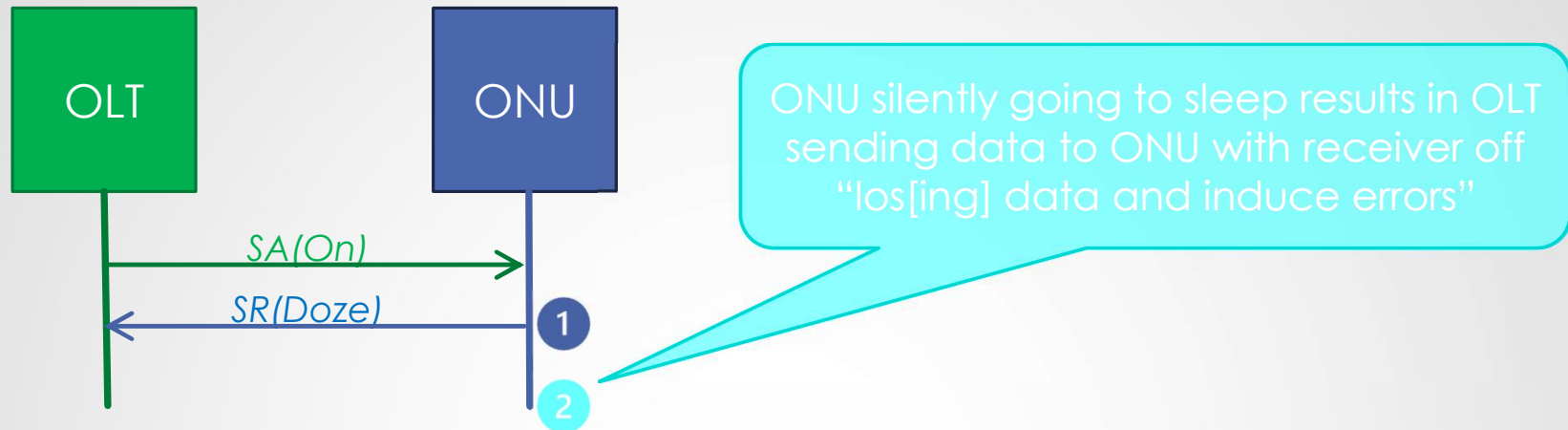
Because ONU is not allowed to make these transitions, if the OLT sees these requests, the conclusion is that the OLT must have become unsynchronized (i.e., the OLT missed a message, received a corrupt message, etc.), not that the transition occurred

Petitioners' Proposed G.987.3 Direct Transition Modification

Figure 16-1 – G.9873 ONU State Transition Diagram

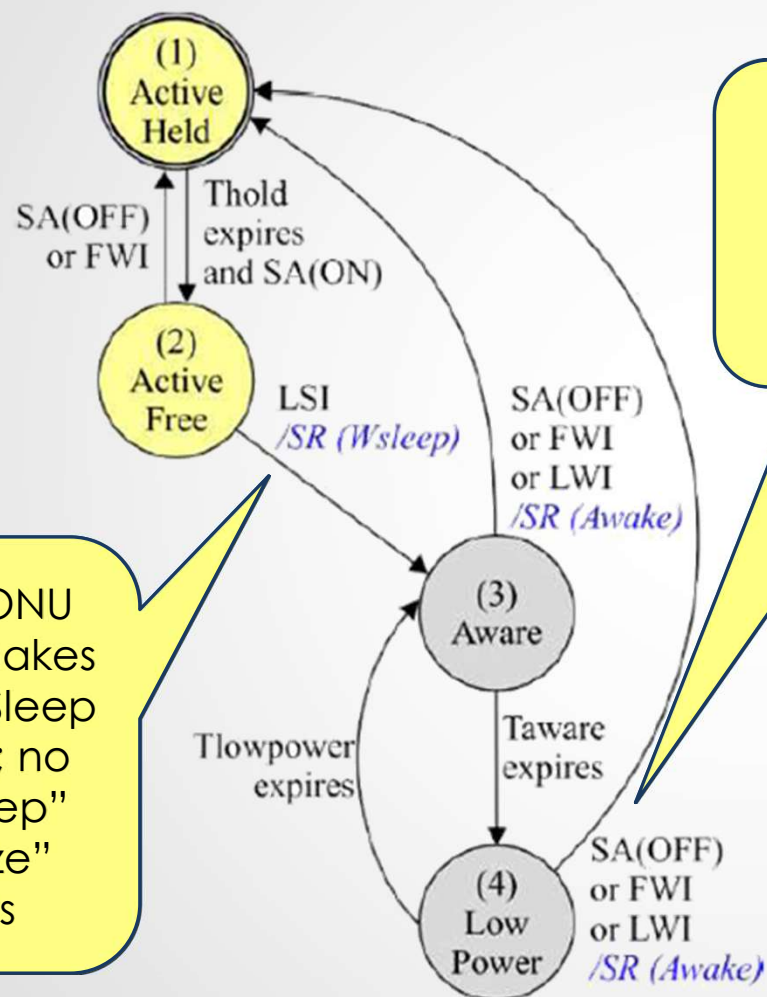


Petitioner's Proposal Breaks G.987.3's Design



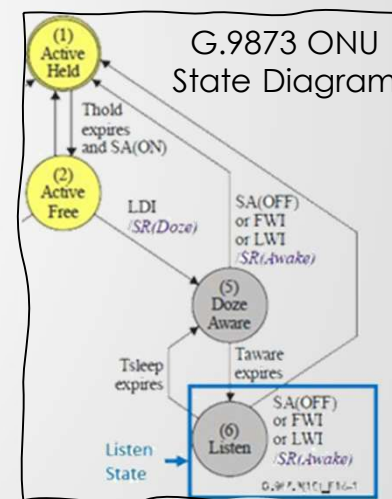
G.9807.1 ONU Design Is Different Than Petitioners' Proposal

Figure C.16.1
G.9807.1 XGS-PON ONU State Transition Diagram



G.9807.1 ONU now only makes "Watchful Sleep" requests; no more "Sleep" and "Doze" requests

G.9807.1 ONU no longer has "Sleep" and "Listen" states, but only the one "Low Power" state



Petitioners identified G.987.3 1st State (6) Is **No Longer Present** in G.9807.1 ONU

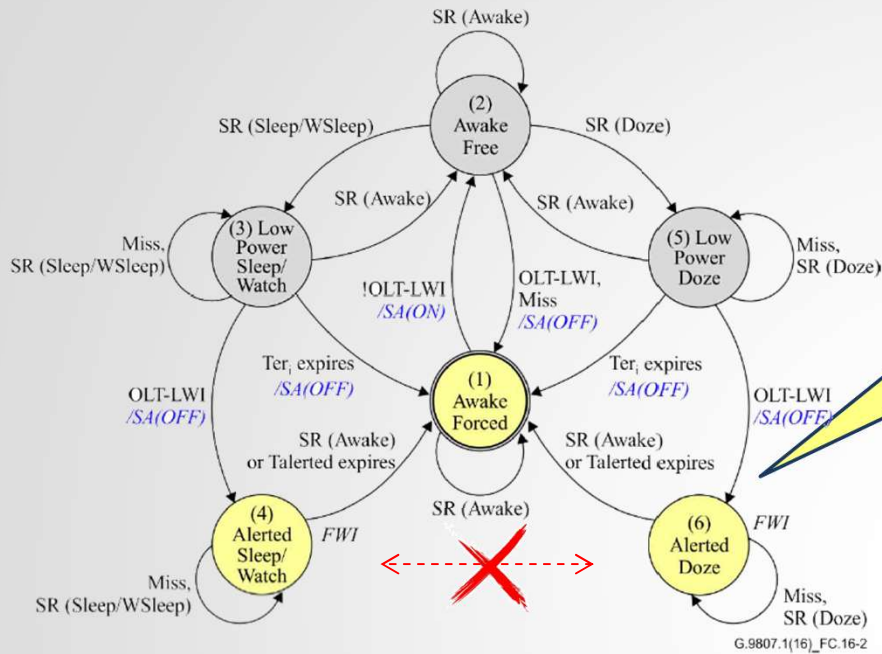
Pet. 16
(citing Ex. 1007 Fig. 16-1)
(annotated showing first state)

G.9807.1(16) FC.16-1

Ex. 1010 at 234

POR 29-32

G.9807.1 Still Disallows Petitioners' Suggestion



G.9807.1 OLT still supports G.987.1 ONU Doze and Sleep modes **Petitioners' point to**

Table 16.7 – OLT state transition and output table

Inputs	OLT power management states					
	(1) Awake Forced	(2) Awake Free	(3) Low Power Sleep/Watch	(4) Alerted Sleep/Watch FWI	(5) Low Power Doze	(6) Alerted Doze FWI
SR (Awake)	*	*	→ (2)	→ (1)	→ (2)	→ (1)
SR (Sleep/WSleep)	* /SA(OFF) (Note 1)	→ (3)	*	*	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)
SR (Doze)	* /SA(OFF) (Note 1)	→ (5)	→ (1) /SA(OFF) (Note 2)	→ (1) /SA(OFF) (Note 2)	*	*

NOTE 2 – Direct transitions between Doze mode and Cyclic Sleep mode are disallowed. When the OLT receives a request to execute such a transition, it attempts to regain state machine synchronization by waking up the ONU. The transitions are not shown on the diagram for the sake of compactness.

G.9807.1 OLT still supports forbids Petitioners' suggested modification

Ex. 1010 at 238
(Shown in part highlighting added)

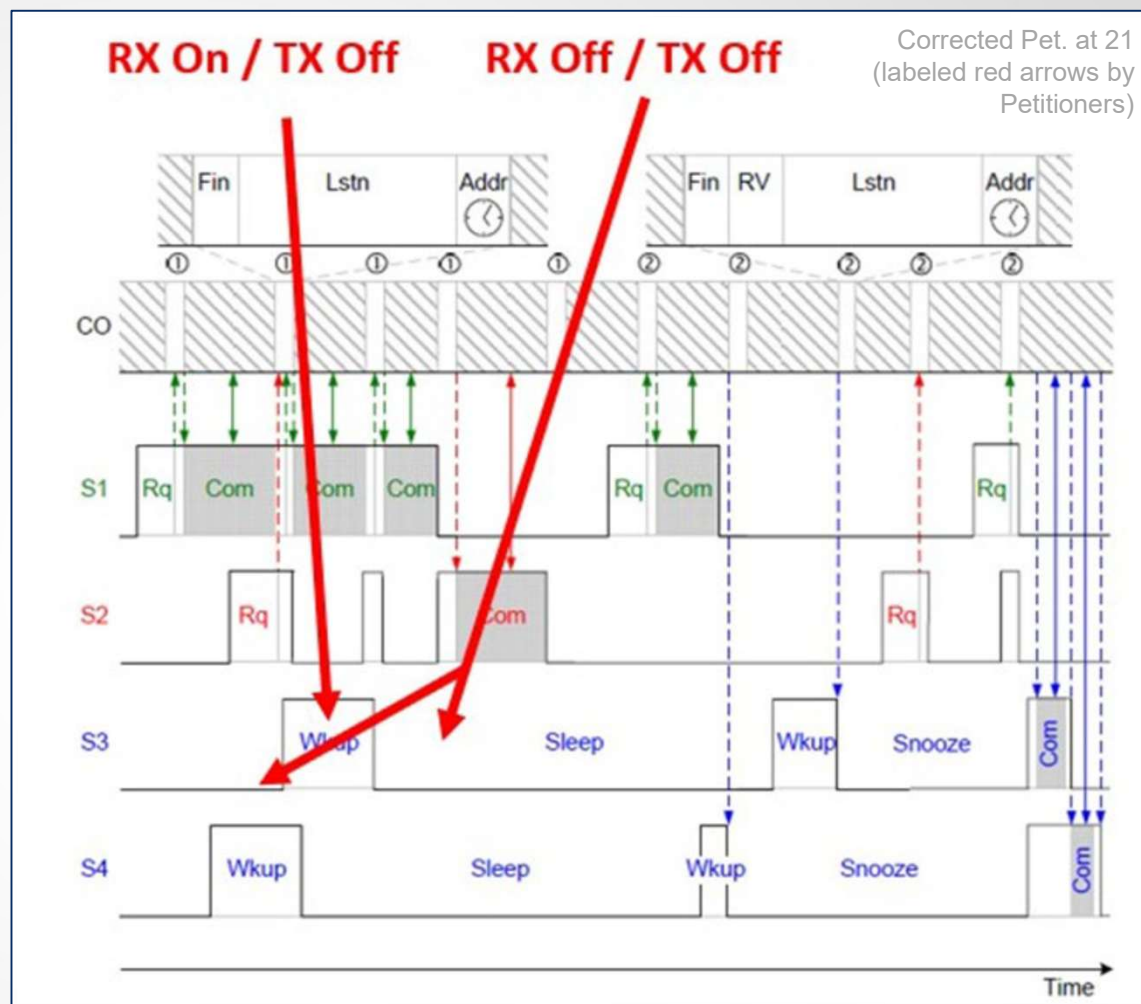
Röger's Direct Transitions OK b/c CO Manages S3/S4 Power

"Röger's design is not like G.987.3's that has a Doze mode that can receive downstream data" "[t]he two fundamental designs are incompatible"

Ex. 2007 ¶121-28

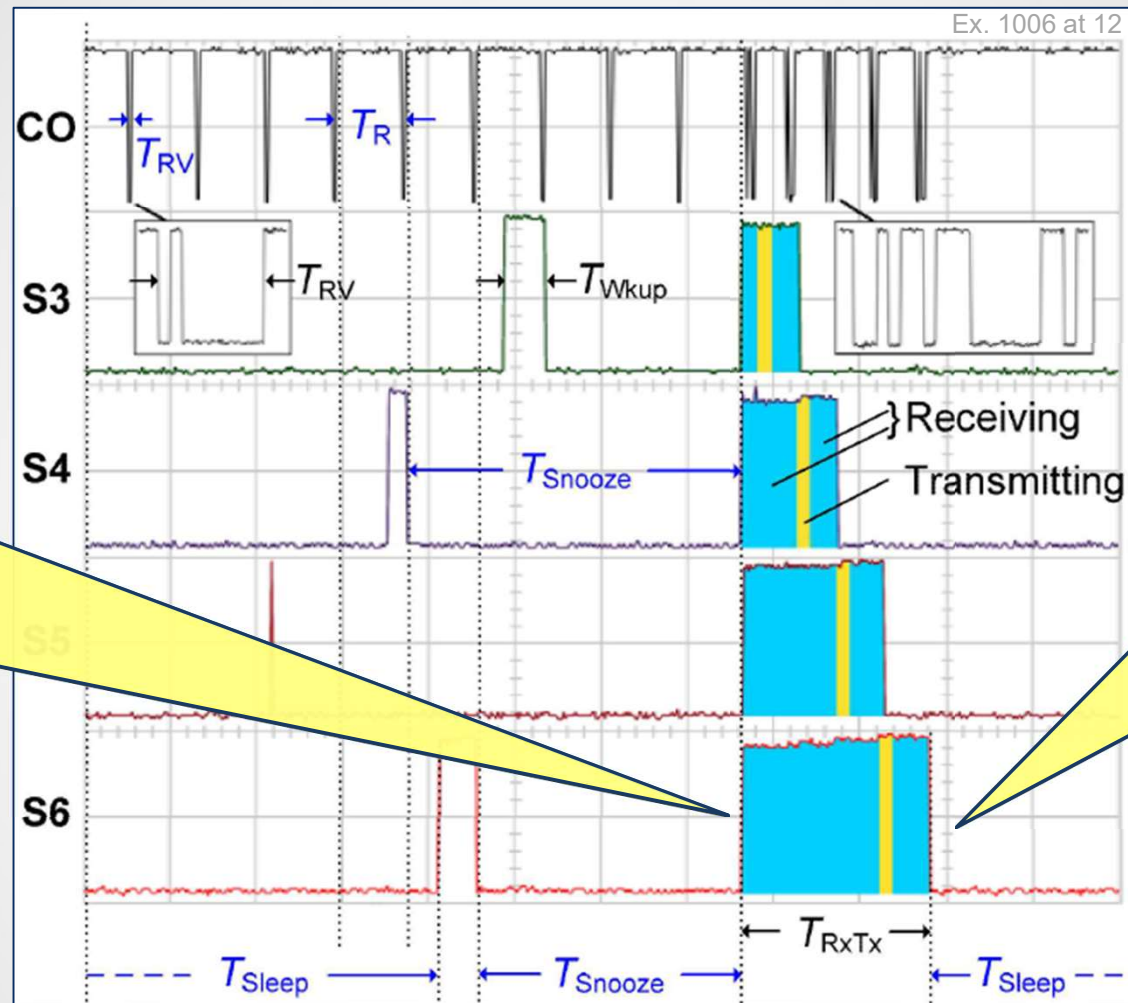


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S3/S4 may toggle Rx as CO knows S3/S4 cannot receive downstream data

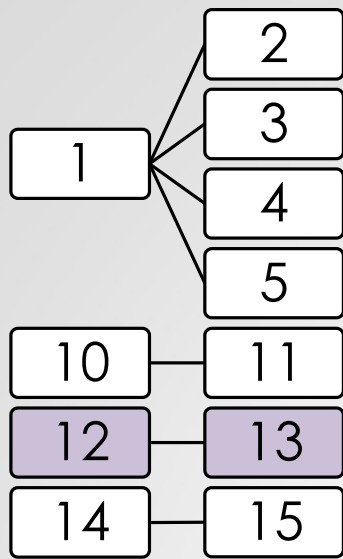
Röger's Direct Transitions OK b/c CO Manages S3/S4 Power



S6 ONU transitions from Snooze to the Receive mode at the "precise rendezvous time" CO previously provided

CO puts S6 to sleep by sending an "End" command and will not send data until next rendezvous

Röger's S6 may not toggle Rx as CO expects
S6 ability to receive downstream data



Claim 12 Requires OLT Sending Consent Message
When ONU Is in Low Power Mode

Message Must Allow ONU to *Remain* In Low Power State

12D

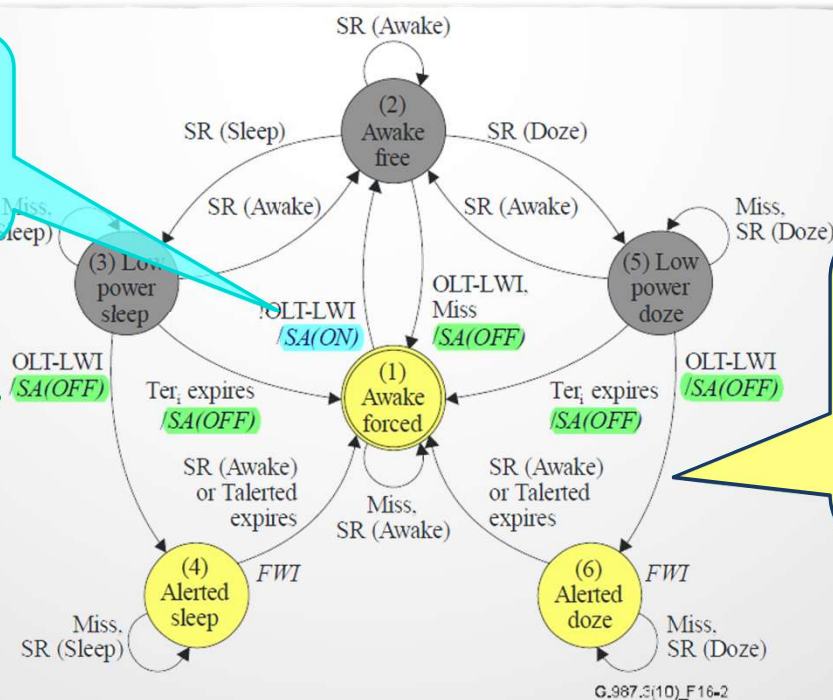
wherein the generated messages comprises a **periodic consent message to allow the optical network unit to remain in either the first low power state or the second low power state.**

to the plain language of the claim. There is no express requirement in 12[D] that the ONU *already* be in a low power state when it receives the claimed message—that

Reply at 24

SA(On) Only Allows ONU to enter, not remain, in a low power state

All other OLT SA messages take ONU **out** of low power state

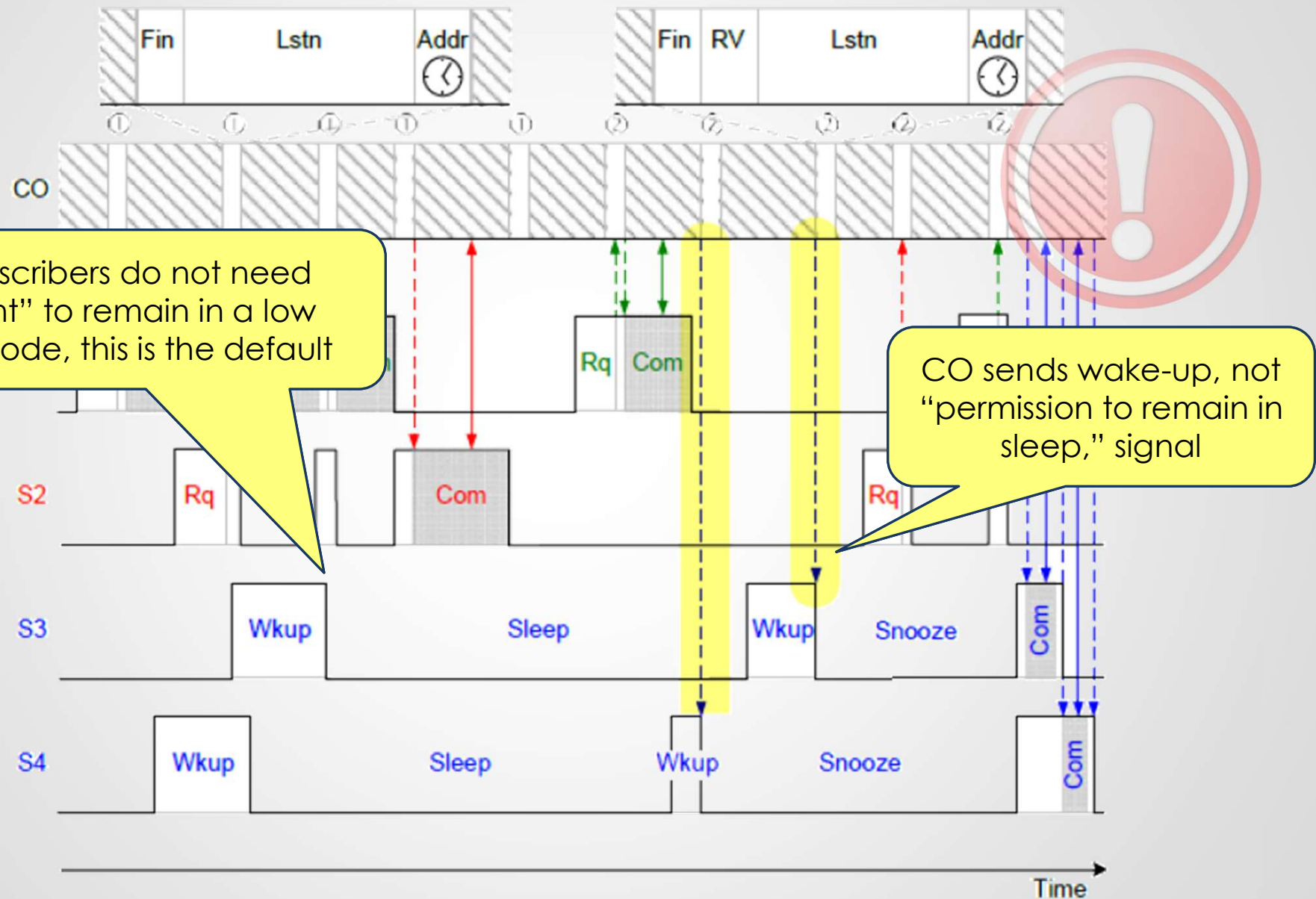


ONU must transition even with additional SA(ON) messages, such as to handle local events

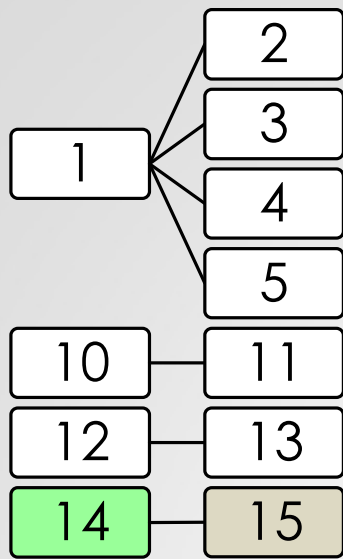
See Ex. 1007 Tbl. 16-1 at *I_{aware}*

POR 43-; Sur-Reply 22-23

Message Must Allow ONU to *Remain* In Low Power State



POR 43-; Reply 26; Sur-Reply 22-23

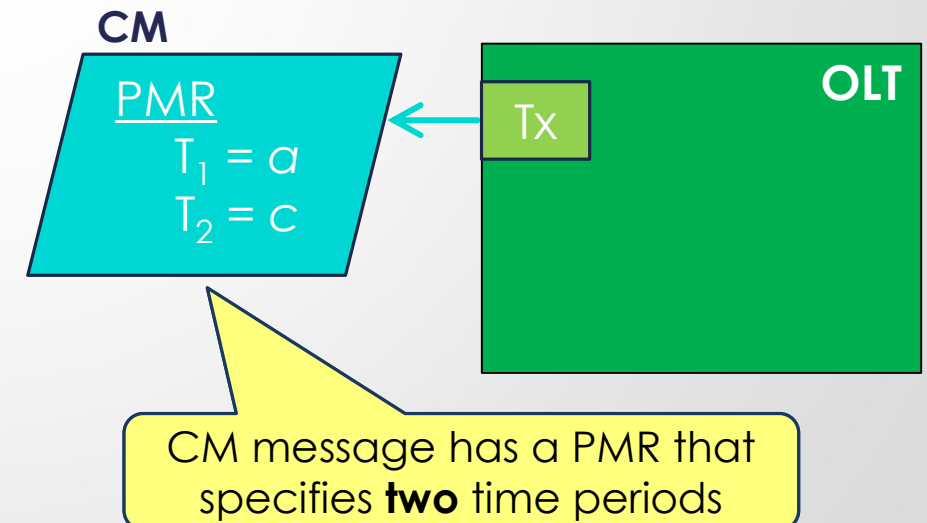
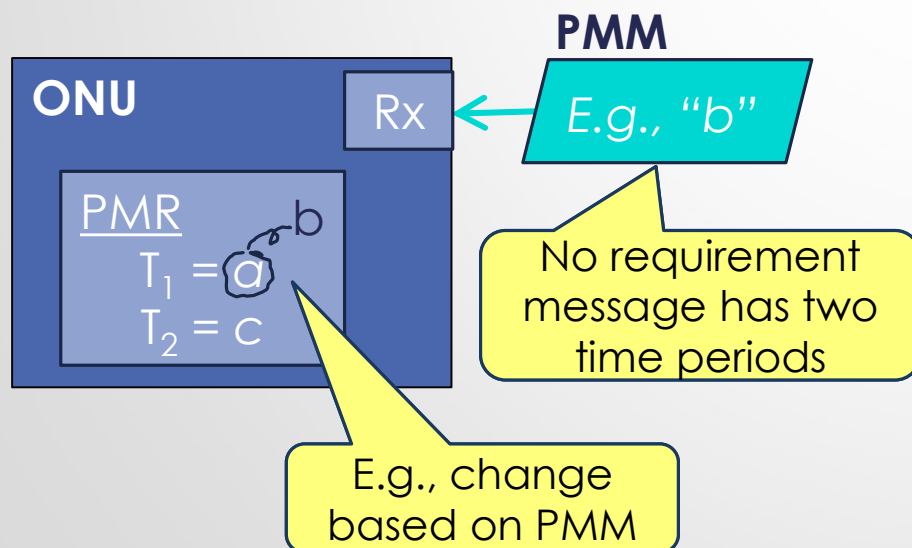


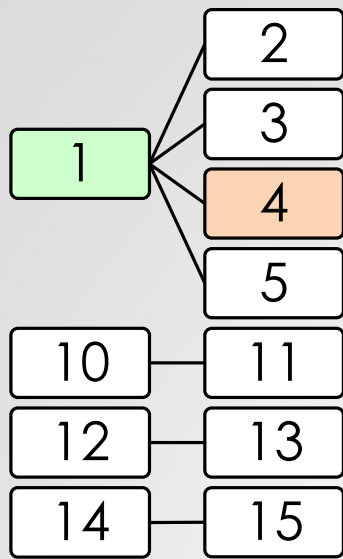
Claim 15 Requires One Power Management Rule Specifying Two Time Periods

Claim 15 Is Different than 1–3; Requires 1:2 Relationship

1F	receiving, by the receiver, a power management message ["PMM"] from an optical line terminal (OLT); and
1G	changing the power management rule ["PMR"] based on the received power management message.
3	3. The method of claim 1, wherein the power management rule specifies a first time period for operation in the first state and a second time period for operation in the second state and wherein the transitioning is performed upon expiration of at least one of the first time period and the second time period.

15	15. The system as in claim 14, wherein: the OLT is configured to transmit the control message ["CM"] that includes the power management rule that specifies a first time period for operation in the first low power state and a second time period for operation in the second low power state and to control the ONU to transition from the first low power state to the second low power state upon expiration of at least one of the first time period and the second time period.



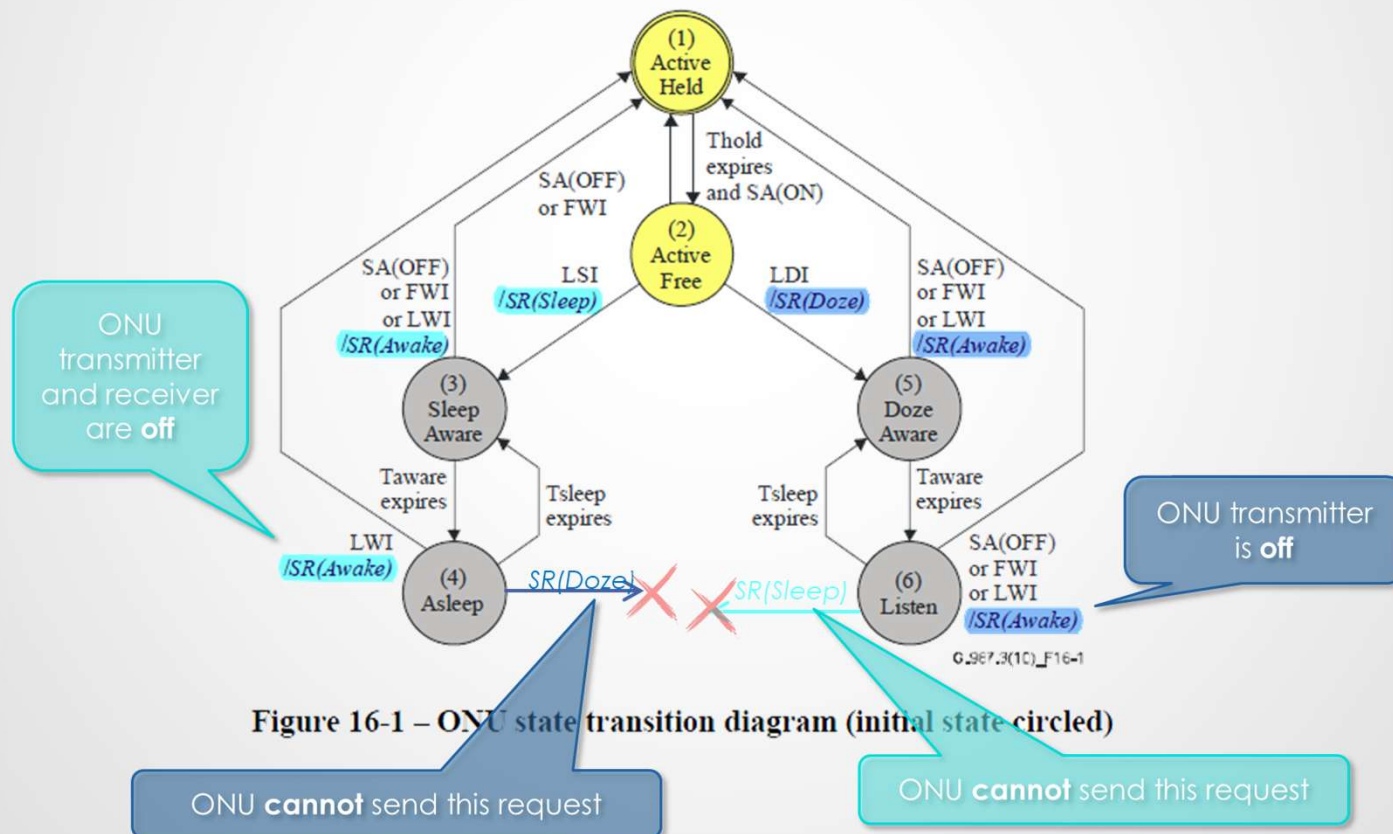


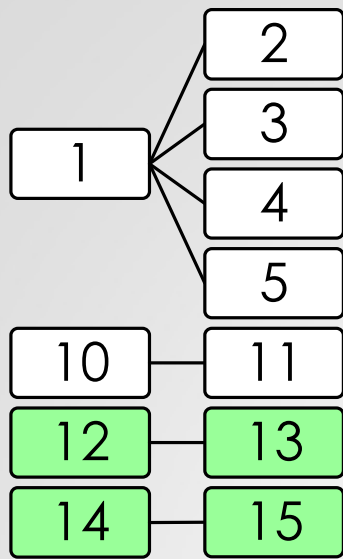
Claim 4: Petitioners Have Not Shown ONU
Would or Could Send Indication Message

ONU Cannot Request Direct Sleep-Doze Transition

4

4. The method of claim 1, further comprising: **transmitting, to an optical line terminal, a message indicative of the transitioning between the first state and the second state.**





Direct Transition Construction Dispute

Claim Differentiation Is Merely a Presumption

12B	a processor configured to generate messages for controlling <u>a transition</u> of an optical network unit from a first low power state in which a receiver of the optical network unit is turned on but a transmitter of the optical network unit is turned off to a second low power state in which both the receiver and the transmitter of the optical network unit are turned off;
14B	an optical network unit (ONU) operable in a first low power mode in which the ONU is able to receive but not transmit and a second low power mode in which the ONU is not able to either receive or transmit, wherein the ONU is configured <u>to transition</u> from the first low power mode to the second low power mode and <u>to transition</u> from the second low power mode to the first low power mode based on a power management rule, and wherein the ONU changes a power management rule based on a received power management message;

Anderson Corp. v. Fiber Composites, LLC,

474 F.3d 1361, 1370 (Fed. Cir. 2007) (citations omitted)

“[T]he written description and prosecution history [may] overcome any presumption arising from the doctrine of claim differentiation.”)

Multiform Desiccants, Inc. v. Medzam, Ltd.,

133 F.3d 1473, 1480 (Fed. Cir. 1998)

“[T]he doctrine of claim differentiation cannot broaden claims beyond their correct scope, determined in light of the specification and the prosecution history.”

“Transition From . . . To . . . and To . . . From” Means Directly

12B	a processor configured to generate messages for controlling a transition of an optical network unit <u>from</u> a first low power state in which a receiver of the optical network unit is turned on but a transmitter of the optical network unit is turned off <u>to</u> a second low power state in which both the receiver and the transmitter of the optical network unit are turned off;
14B	an optical network unit (ONU) operable in a first low power mode in which the ONU is able to receive but not transmit and a second low power mode in which the ONU is not able to either receive or transmit, wherein the ONU is configured to transition from the first low power mode <u>to</u> the second low power mode and to transition from the second low power mode <u>to</u> the first low power mode based on a power management rule, and wherein the ONU changes a power management rule based on a received power management message;

1. During prosecution, the applicant argued that the Pfeiffer reference did not render claim 14 (then 16) obvious because it failed to disclose **direct** transitions and simultaneously amended claim language to replace “between” with “to/from” and “from/to” indicating the later means direct
2. The specification differentiates “between . . . and,” which include indirect transitions, from “to/from” that are limited to direct transitions
3. The specification pervasively advocates that the invention is direct transitions between low power states beginning with the abstract
4. There is not a single embodiment that does not have direct transitions
5. ’892 Patent disparages “conventional power management technique[s]” for **not** directly transitioning

1. Prosecution History Supports Patent Owner's Position

1. (Currently Amended) A method of optical communication in a passive optical network comprising: ...
... transitioning the ONU directly ~~between~~ from the first state ~~and to~~ the second state and transitioning the ONU directly from the second state to the first state, based on a power

Didn't add "direct," to Claim 1 but changed "between ... and" to "from ... to"

Ex. 1002 at 30

16. (Currently Amended) A passive optical network (PON) communications system, comprising: ...
...either receive or transmit, wherein the ONU is configured to transition ~~between~~ from the first low power mode ~~and to~~ the second low power mode and to transition from the second low power

Made same modification to now Claim 14

Id. at 33

Independent Claims 7, 12, and 16 have been amended in a similar manner as Independent Claim 1, and are thus allowable for at least the same reasons as those provided above, and also

Id. at 26

Argued now Claim 14 was patentable for the same reason: failing to show bidirectional **direct** transitions.

2. Spec. Uses “Between” for Indirect and “To/From” for Direct

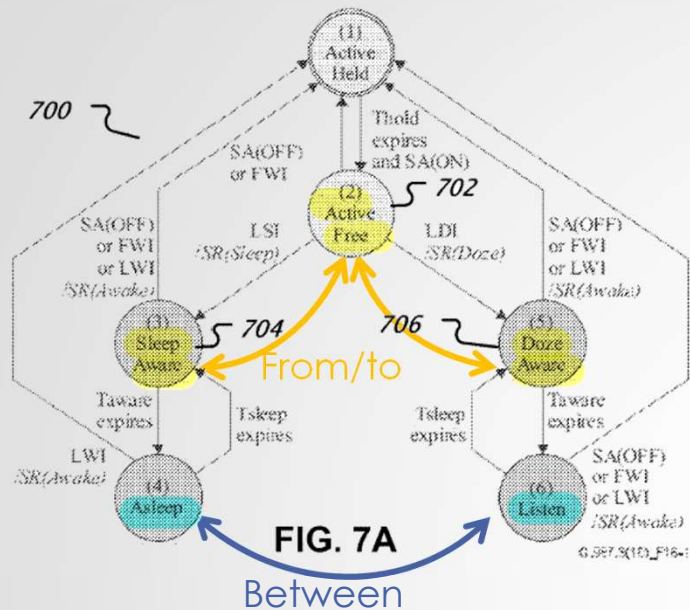


FIG. 7A shows the state machine behavior 700 of a PON ONU, as specified in one currently published PON standard (ITU-T G.987.3, 10-Gigabit-capable passive optical networks (XG-PON): Transmission convergence (TC) layer specification, publication date October 2010). From the initial state “Active Free” 702, the ONU can either transition into a Sleep Aware state 704 or a Doze Aware state 706 (further described below). However, no direct transition between the Doze Aware and the Sleep Aware states 704, 706 are provided. Conventional ONUs therefore lack the

Ex. 1001 at 4:25–34

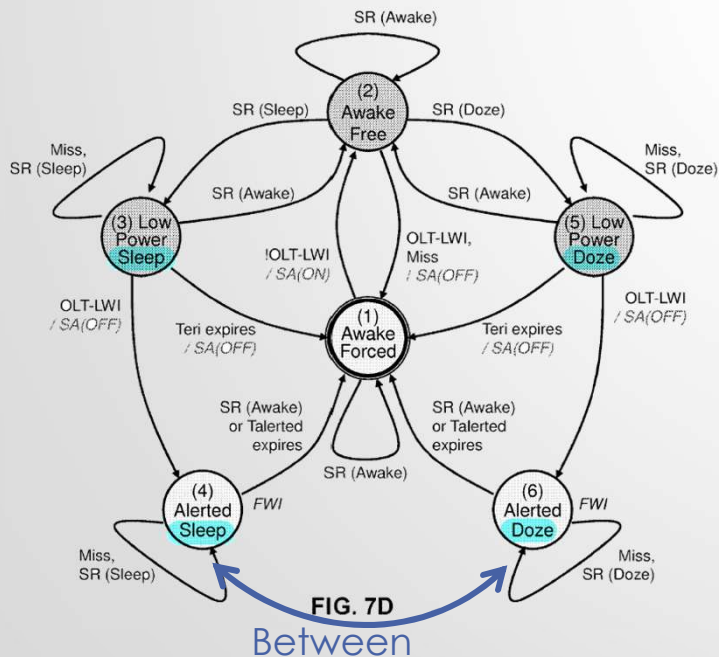


FIG. 7D is an example of a prior art OLT state machine. Note that the transition between sleep and doze states always goes through an awake state.

Id. at 11:65–67

3. Specification Pervasively Advocates Invention Is Direct Transitions

SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.,

242 F.3d 1337, 1341 (Fed. Cir. 2001)

Noting “from the outset the specification” characterized the limitation as having the restriction

GPNE Corp. v. Apple Inc., 830 F.3d 1365, 1370 (Fed. Cir. 2016),

830 F.3d 1365, 1370 (Fed. Cir. 2016)

“When a patent ‘repeatedly and consistently’ characterizes a claim term in a particular way, it is proper to construe the claim term in accordance with that characterization.”

4 & 5. Every Embodiment Has Direct Transitions Prior Art Lacks

Accent Packaging, Inc. v. Leggett & Platt, Inc.,
707 F.3d 1318, 1326 (Fed. Cir. 2013) (citation omitted)

“[A] claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”

UltimatePointer, LLC v. Nintendo Co., Ltd.,
816 F.3d 816, 823–24 (Fed. Cir. 2016)

“[T]he repeated extolling of the virtues of [one feature], and the repeated criticism of [another] clearly point to the conclusion that the . . . claims [are] limited to [the extolled feature].”

(further described below). However, no direct transition between the Doze Aware and the Sleep Aware states 704, 706 are provided. Conventional ONUs therefore lack the technology of directly transitioning between two low power consumption states without having to go through an active state (e.g., a full powered state). In one detrimental aspect, such a transition through the active state may increase the power consumed by the ONU, thereby undesirably reducing batter life.

Ex. 1001 4:34–40

Response at 26, 30

End of Presentation