

BACnet Errata
ANSI/ASHRAE STANDARD 135-2008
A Data Communication Protocol for Building Automation and Control Networks

February 10, 2010

This document lists all known *errata* to ANSI/ASHRAE 135-2008 as of the above date. Each entry is cited first by clause, then page number, except where an erratum covers more than one clause. The outside back cover marking identifying the first printing of Standard 135-2008 is "Product Code: 86441 12/05". Items 26) through 54) have been added since the previously published errata sheet dated May 6, 2009 was distributed.

1) Clause 21, p.468. The position of the pulse-rate enumeration value in BACnetPropertyIdentifier is incorrect. The changes that should be made are shown below (*italic* for added text, ~~strikeout~~ for deleted):

21 FORMAL DESCRIPTION OF APPLICATION PROTOCOL DATA UNITS

```
...
BACnetPropertyIdentifier ::= ENUMERATED {
    accepted-modes      (175),
    ...
    priority             (86),
    pulse-rate          (186),
    priority-array      (87),
    ...
    protocol-version    (98),
    pulse-rate         (186),
    read-only           (99),
    ...
}
```

2) Clause 13.5.2, p.307. The language was unclear about the value of the timestamp for acknowledgement messages. It was determined from studying other parts of the standard that the correct timestamp is the time at which the acknowledgement message is generated. A clarifying sentence is added as shown:

13.5.2 Service Procedure

After verifying the validity of the request, the responding BACnet-user shall attempt to locate the specified object. If the object exists and if the 'Time Stamp' parameter matches the most recent time for the event being acknowledged, then the bit in the Acked_Transitions property of the object that corresponds to the value of the 'Event State Acknowledged' parameter shall be set to 1, a 'Result(+)' primitive shall be issued, and an event notification with a 'Notify Type' parameter equal to ACK_NOTIFICATION shall be issued. Otherwise, a 'Result(-)' primitive shall be issued. An acknowledgment notification shall use the same type of service (confirmed or unconfirmed) directed to the same recipients to which the original confirmed or unconfirmed event notification was sent. *The 'Time Stamp' conveyed in the acknowledgement notification shall not be derived from the 'Time Stamp' of the original event notification, but rather the time at which the acknowledgement notification is generated.*

3) Clause 12.11.43, p. 186. A sentence appears in this clause that was mistakenly copied from Clause 12.11.41, where it properly applies. It should be removed as shown. The Slave_Address_Binding property is a combination of configured and live data, and as such is not expected to be writable.

12.11.43 Slave_Address_Binding

This property, of type List of BACnetAddressBinding, describes the set of slave devices for which this device is acting as a Slave-Proxy as described in 16.10.2. This property shall be present if the device is capable of performing the functions of a Slave-Proxy device. ~~If present, and the device is directly attached to an MS/TP network, then this property shall be writable.~~

4) ANNEX C, p. 497. There is a discrepancy between the object definition of the Event-Enrollment object in section 12.12 of the standard and the Event-Enrollment object property list in Annex C. The 'notification-class' property is incorrectly marked as OPTIONAL in Annex C. The word OPTIONAL should be stricken as shown

ANNEX C - FORMAL DESCRIPTION OF OBJECT TYPE STRUCTURES (INFORMATIVE)

...

```
EVENT-ENROLLMENT ::= SEQUENCE {
    ...
    notification-class          [17]  Unsigned OPTIONAL,
    ...
}
```

5) ANNEX C, p. 502. The name of a property in the device object definition is incorrect. It should be changed as shown.

```
DEVICE ::= SEQUENCE {
    ...
    max-APDU-length-supported supported accepted [62]  Unsigned,
    ...
}
```

6) Clause 12.17.32.1, p. 214. The clause incorrectly states that for the FLOATING_LIMIT algorithm, the Low_Diff_Limit should be the negation of the Error_Limit, but the algorithm subtracts that value already, so no sign change should occur (the algorithm is unusable as written, so this is an erratum).

12.17.32.1 Conditions for Generating a TO-OFFNORMAL Event

...

$$\begin{aligned} \text{Low_Diff_Limit} & \leftarrow \text{Error_Limit} \\ \text{Low_Diff_Limit} & = \text{Error_Limit} \end{aligned}$$

7) Clause 12.17.33, p. 214. The description of Deadband defines "Error" as a signed quantity, but "Error" it is also previously defined in 12.17.32.1 and 12.17.32 as an absolute value. To avoid confusion, the name of the calculated value in this subclause is changed as follows.

12.17.33 Deadband

This property, of type REAL, shall specify a positive offset from the Error_Limit property, which defines a band around the *SignedError* (the difference between the Setpoint and the Controlled_Variable_Value properties) within the range of (Error_Limit — Deadband) and ((—Error_Limit)+Deadband). The *SignedError* must remain within this range for a TO-NORMAL event to be generated under these conditions :

- (a) the *SignedError* must fall below the Error_Limit minus Deadband,
- (b) the *SignedError* must exceed the —Error_Limit plus the Deadband,
- (c) the *SignedError* must remain within this range for a minimum period of time, specified in the Time_Delay property, and
- (d) the TO-NORMAL flag must be set in the Event_Enable property.

This property is required if intrinsic reporting is supported by this object.

8) Table of Contents, page vi. In the title for L.1, BACnet is misspelled. It should be corrected as shown:

L.1 ~~BACnet~~ BACnet Operator Workstation (B-OWS)

9) Figure 5-9, p. 43. The top of the figure has a misspelling. Correct as shown:

(Segmented ~~Response~~ Response, with Application Program Flow Control)

10) A comment in the BACnetPropertyIdentifier in Clause 21, p. 471, incorrectly lists node_subtype and node_type again with incorrect values (they are also correctly shown as values 207 and 208). Correct as follows:

~~—see node_subtype— (216),~~
~~—see node_type— (217),~~
 -- enumeration values 216-217 are reserved for future addenda

11) An incorrect Clause title exists on p. 167. Correct as shown:

12.7.25.1 Conditions for Generating a ~~TO-NORMAL-OFF~~NORMAL Event

A TO-OFFNORMAL event is generated under these conditions:

13) In Clause 12.11.16 on p. 182, "read only" should be "read-only". Correct as follows:

12.11.16 Object_List

This ~~read only~~ read-only property is a BACnetARRAY of Object_Identifiers ...

14) In Clause 12.12.5 on p. 188, "read only" should be "read-only". Correct as follows:

12.12.5 Event_Type

This ~~read only~~ read-only property, of type BACnetEventType, ...

g) In Clause D.11 on p. 519, "6.0" should be "360", since the property has units of minutes, not hours. Correct as follows:

D.11 Examples of a Device Object

...
 Property: UTC_Offset = ~~6.0~~ 360
 ...

15) In the BACnetPropertyStates production in Clause 21 on p. 472, the last line is missing a comma and should be corrected as follows:

```
BACnetPropertyStates ::= CHOICE {
...
door-alarm-state [15] BACnetDoorAlarmStateBACnetDoorAlarmState,
...
}
```

16) In the ACCESS-DOOR definition in ANNEX C on p. 509, several OPTIONAL designators need to be corrected to match Table 12-30 and the corresponding property description clauses.

```
ACCESS-DOOR::= SEQUENCE {
...
door-status           [231] BACnetDoorStatus OPTIONAL,
lock-status           [233] BACnetLockStatus OPTIONAL,
secured-status       [235] BACnetDoorSecuredStatus OPTIONAL,
...
}
```

```

door-extended-pulse-time [227]  Unsigned-OPTIONAL,
...
}

```

17) In Table 12-15 on p. 189, Previous_Notification_Count was left out of the table entry for BUFFER_READY. This parameter is defined as a member of the BACnetEventParameters production in Clause 21, and its use is defined in Clause 1.3.7. Add to the table as shown:

Table 12-15. Event_Types, Event_States, and their Parameters

Event_Type	Event_State	Event_Parameters
...
BUFFER_READY	NORMAL	Notification_Threshold <i>Previous_Notification_Count</i>
...

18) To complete the addition to Table 12-15 above, a new entry needs to be made to Clause 12.12.7. After the entry for Notification_Threshold, add the following new description:

```

Notification_Threshold      This parameter ...

Previous_Notification_Count  This parameter, of type Unsigned32, applies to the
                             BUFFER_READY algorithm. It contains the value that
                             Total_Record_Count had at the time the previous
                             BUFFER_READY notification occurred.

List_Of_Life_Safety_Alarm_Value  This parameter...
s

```

19) In ANNEX F, Section F.1.5, p. 561, two cases of X'0C' appear with an extra space, as X'0C '. Remove the extra space as shown:

F.1.8 Encoding for Example E.1.8 - GetEventInformation Service

```

...
X'3E' PD opening Tag 3
  X'0C' X'0C' SD context Tag 0 (Time L=4)
  X'0F230014' Time 15:35:00.20
  X'0C' X'0C' SD context Tag 0 (Time L=4)
  X'FFFFFFFF' Time unspecified
  X'0C' SD context Tag 0 (Time L=4)
  X'FFFFFFFF' Time unspecified

```

20) In Clause 12.23, pp. 237, 239, 241, 243, in the subheading at the top of the page, the word "Conveter" should be "Converter".

21) In Clause 21, p. 446, the 'unknown-device', 'unknown-route', and 'value-not-initialized' enumerations were left out of the Error production. Insert as follows:

```

Error ::= SEQUENCE {
  ...
  error-code  ENUMERATED {
  ...
  timeout                (30),
  unknown-device         (70),
  unknown-object         (31),
  unknown-property       (32),
  -- this enumeration was removed (33),

```

```

        unknown-route           (71),
        unknown-vt-class        (34),
        ...
        unsupported-object-type  (36),
        value-not-initialized    (72),
        value-out-of-range      (37),
        ...
        -- see unknown-device    (70),
        -- see unknown-route     (71),
        -- see value-not-initialized (72),
        ...
    }
}

```

22) In Clause 13.12.1.2.1.7, p. 322, the last sentence is no longer valid since the removal of the Recipient property from the Event Enrollment object. Delete text as shown:

13.12.1.2.1.7 Event Priorities

This parameter, of type BACnetARRAY[3] of Unsigned, shall convey the priorities specified in the Priority property of the associated Notification Class object. ~~In the case where an Event Enrollment Object is used without an associated Notification Class Object, the three fields of this parameter shall all contain the value of the Priority property of the Event Enrollment Object.~~

23) An enumeration for "state-description" was left out of the BACnetPropertyIdentifier production in Clause 21, p. 469. A later comment correctly indicates its value (222), but the non-comment version was not included. Correct by inserting the enumeration value as shown:

```

slave-proxy-enable (172),
start-time (142),
state-description (222),
state-text (110),
status-flags (111),

```

24) The Table of Contents, on page vi, is missing an entry for ANNEX N. Add as shown::

M.5 Miscellaneous Lower Priority Message Group (192-255)	649
ANNEX N - BACnet/WS WEB SERVICES INTERFACE (NORMATIVE)	650
HISTORY OF REVISIONS	683

25) The title of Clause N.4, p. 652, is incorrect. "N.4 Reference Notes" should be "N.4 Reference Nodes".

26) The clauses for the DUPLICATE_NAME and DUPLICATE_OBJECT_ID error codes are listed under the wrong parent clause. Their usage in Clause 15.9.1.3.1 and 15.10.1.3.1 indicate that they are to be used with the PROPERTY error class, and the tests in 135.1 are written as such, but they are listed under the SERVICES class in Clause 18.6. There is no documented usage of these error codes in the SERVICES class, so the following clauses should be moved as shown:

~~18.6.4~~ 18.3.x **DUPLICATE_NAME** - An attempt has been made to write to an Object_Name property with a value that is already in use in a different Object_Name property within the device.

~~18.6.5~~ 18.3.y **DUPLICATE_OBJECT_ID** - An attempt has been made to write to an Object_Identifier property with a value that is already in use in a different Object_Identifier within the same device.

27) The History of Revisions at the end of the standard is missing a reference to the creation of Amendment 1 to ISO standard EN ISO 16484-5 2007. Add a new entry where shown:

...
1	6	Addendum f to ANSI/ASHRAE 135-2004 Approved by the ASHRAE Standards Committee January 27, 2007, and by the ASHRAE Board of Directors March 25, 2007, and by the American National Standards Institute March 26, 2007. 1. Add new Access Door object type.
1	6	Amendment 1 to EN ISO 16484-5 2007 <i>This amendment to the ISO standard contains the same technical content as the cumulative changes in Addenda a, c, d, e, and f to ANSI/ASHRAE Standard 135-2004.</i>
1	7	Addendum b to ANSI/ASHRAE 135-2004 Approved by the ASHRAE Standards Committee
...

28) Annex C, p. 511. The entry for TRENDLOG-MULTIPLE contains two errors. The "::=" should not have a space in it, and the log-device-object-property should be of type BACnetDeviceObjectPropertyReference.

```
TREND-LOG-MULTIPLE ::=   ::= SEQUENCE {
    ...
    log-device-object-property [132] SEQUENCE OF BACnetDeviceObjectPropertyReference,
    ...
}
```

29) Table 16-2, p. 364. The entry for Error Parameters is listed as required ("M"), and it should be optional ("U").

Table 16-2. Structure of ConfirmedPrivateTransfer Service Primitives

Parameter Name	Req	Ind	Rsp	Conf
...				
Result(-)			S	S(=)
Error Type			M	M(=)
Vendor ID			M	M(=)
Service Number			M	M(=)
Error Parameters			M U	M U(=)

30) Clause 21, the BACnetPropertyIdentifier production, p. 465. The comment for last-restart-reason is missing the second dash.

```
BACnetPropertyIdentifier ::= ENUMERATED {
    ...
    last-notify-record (173),
    last-restart-reason (196),
    last-restore-time (157),
    ...
    -- see last-restart-reason (196),
    ...
}
```

31) Clause 9.5.6.5, p. 90. In the SoleMasterRestartMaintenancePFM case, the comparison made to N_{poll} should be to N_{poll}-1 as in all other similar places. Additionally, it should be phrased like similar conditions with the additions of "and" as shown (ResetMaintenancePFM shown for reference):

ResetMaintenancePFM

If FrameCount is greater than or equal to $N_{\max_info_frames}$ and TokenCount is greater than or equal to $N_{poll}-1$ and $(PS+1)$ modulo $(N_{\max_master}+1)$ is equal to NS, and SoleMaster is FALSE,

...

SoleMasterRestartMaintenancePFM

If FrameCount is greater than or equal to $N_{\max_info_frames}$ and TokenCount is greater than or equal to $N_{poll}-1$ and $(PS+1)$ modulo $(N_{\max_master}+1)$ is equal to NS, and SoleMaster is TRUE,

...

32) Clause 16.10.2, p. 376. In two places the word “confirmed” is used where it should be “unconfirmed”. There is no “confirmed” Who-Is service. Additionally, the last sentence is missing its final period. Correct as shown.

16.10.2 Who-Is Service procedure

...

If the receiving BACnet-user has a Slave_Proxy_Enable property and the Slave_Proxy_Enable for the receiving port is TRUE, then the BACnet-user shall respond with an I-Am unconfirmed request for each of the slave devices on the MS/TP network that are present in the Slave_Address_Binding property and that match the device range parameters. The I-Am unconfirmed requests that are generated shall be generated as if the slave device originated the service. If the I-Am ~~confirmed~~ **unconfirmed** request is to be placed onto the MS/TP network on which the slave resides, then the MAC address included in the packet shall be that of the slave device. In the case where the I-Am ~~confirmed~~ **unconfirmed** request is to be placed onto a network other than that on which the slave resides, then the network layer shall contain SLEN and SNET filled in with the slave’s MAC address as if it were routing a packet originally generated by the slave ~~device~~ **device**.

33) Clause 18.6, p. 394. Addendum 135-2004b included a definition for LIST_ELEMENT_NOT_FOUND to be included in Clause 18, but that change was not included in 135-2008. Insert new clause as shown.

18.6.X LIST_ELEMENT_NOT_FOUND

A list data item required for carrying out the service request was not found.

34) Clause 21, p. 445. Addendum 135-2004b included a definition for error code *list-element-not-found* to be included in Clause 21 Error production, but that change was not included in 135-2008. Insert new enumeration items according to instructions in square brackets.

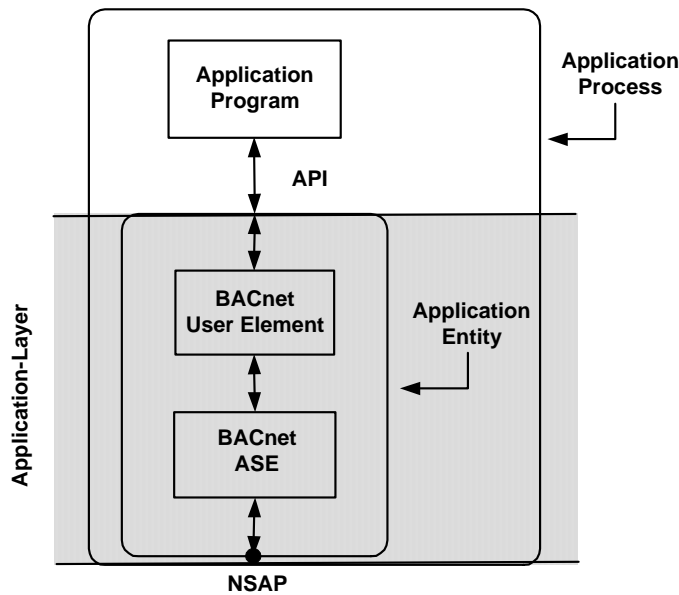
```
Error ::= SEQUENCE {
  ...
  error-code    ENUMERATED {
    ...
    list-element-not-found      (81), [insert in alphabetic order]
    ...
    -- see list-element-not-found (81), [insert in numeric order]
    ...
  }
}
```

35) Clause 12.11.28, p. 184. Addendum 135-2004d makes changes to the APDU_Timeout property that were not carried forward into 135-2008. Correct as shown.

12.11.28 APDU_Timeout

The APDU_Timeout property, of type Unsigned, shall indicate the amount of time in milliseconds between retransmissions of an APDU requiring acknowledgment for which no acknowledgment has been received. A suggested value for this property is ~~10,000~~ **6,000** milliseconds for devices that permit modification of this parameter. Otherwise, the default value shall be ~~60,000~~ **10,000** milliseconds. This value shall be non-zero if the Device object property called Number_Of_APDU_Retries is non-zero. See Clause 5.3.

36) Figure 5-1, p. 14. The shading was left off portion of the figure. It should look like the following.



37) Clause 13.3.6, p. 301. There is an erroneous statement about Boolean data in the description of an analog algorithm. It should be removed as shown.

An OUT_OF_RANGE clears when the referenced property attains a value greater than the (Low_Limit + Deadband) or a value less than the (High_Limit - Deadband) and remains there for Time_Delay seconds. ~~Note that the limit values may be Boolean TRUE or FALSE as well as analog values.~~ The Event Enrollment object generates a TO-NORMAL transition. The event notification shall show an 'Event Type' of OUT_OF_RANGE. See Figure 13-8.

38) Clause 21, p. 473. There is an erroneous comma after 'hardware-watchdog', and the single ellipsis character should be changed to three periods.

```

BACnetRestartReason ::= ENUMERATED {
    ...
hardware-watchdog, (5),
    hardware-watchdog (5),
    ...
}

```

39) Clause 21, p. 438. In the ReadRange-ACK production, ABSTRACT-SYNTAX.&Type is misspelled.

```

ReadRange-ACK ::= SEQUENCE {
    ...
    itemData [5] SEQUENCE OF ABSTRACT-SYNTAX.&TYPEType,
    ...
}

```

40) Clause 21, p. 445. There is an erroneous comma after 'invalid-tag'.

```

error-code  ENUMERATED {
...
invalid tag (57),
invalid-tag (57),
...

```

41) Clause 21, p. 459. In the BACnetLogData production, SEQUENCE OF is misspelled..

```

BACnetLogData ::= CHOICE {
log-status [0] BACnetLogStatus,
log-data [1] SEQUENCE-of OF CHOICE {
...

```

42) Clause 21, p. 460. In the BACnetLogRecord production, there is an erroneous comma after logDatum

```

BACnetLogRecord ::= SEQUENCE {
timestamp [0] BACnetDateTime,
logDatum [1] CHOICE {
...
},
}
statusFlags [2] BACnetStatusFlags OPTIONAL
}

```

43) Clause 21, p. 460. In the BACnetLogging Type, the single ellipsis character should be three period characters.

```

BACnetLoggingType ::= ENUMERATED {
polled (0),
cov (1),
triggered (2),
...
}

```

44) Clause 21, p. 460. In the BACnetLogMultipleRecord, there is an extraneous comma after 'logData'.

```

BACnetLogMultipleRecord ::= SEQUENCE {
timestamp [0] BACnetDateTime,
logData [1] BACnetLogData,
logData [1] BACnetLogData
}

```

45) Clause 21, p. 461. In the BACnetNodeType, there is an extraneous comma after 'other'.

```

BACnetNodeType ::= ENUMERATED {
...
other (11),
other (11)
}

```

46) ANNEX C, p. 497. In multiple places throughout the ANNEX, the property number for 'profile-name' is incorrect.

```

profile-name [167168] CharacterString OPTIONAL

```

47) ANNEX C, p. 497. The 'scale' property number in the ACCUMULATOR production is incorrect.

```

ACCUMULATOR ::= SEQUENCE {
    ...
    scale    [186187]    BACnetScale,
    ...
}

```

48) ANNEX C, p. 502. Correct multiple errors in DEVICE production as shown.

```

DEVICE ::= SEQUENCE {
    ...
    apdu-timeout    [11]    Unsigned OPTIONAL,
    ...
    configuration-files    [154]    SEQUENCE OF BACnetObjectIdentifier OPTIONAL,
        -- accessed as a BACnetARRAY
    ...
    slave-proxy-enable    [172]    SEQUENCE OF BOOLEAN OPTIONAL,
        -- accessed as a BACnetARRAY
    ...
    auto-slave-discovery    [169]    SEQUENCE OF BOOLEAN OPTIONAL,
        -- accessed as a BACnetARRAY
    ...
}

```

49) ANNEX C, p. 503 and p. 511. The EVENT-LOG and TREND-LOG-MULTIPLE productions have an erroneous space between the double colons and the equals character.

```

EVENT-LOG ::= SEQUENCE {
EVENT-LOG ::= SEQUENCE {
TREND-LOG-MULTIPLE ::= SEQUENCE {
TREND-LOG-MULTIPLE ::= SEQUENCE {

```

50) ANNEX C, p. 510. In the LOAD-CONTROL production, the property number for state-description is incorrect, and the single dash character in the comment after event-time-stamps should be two hyphen characters.

```

LOAD-CONTROL ::= SEQUENCE {
    ...
    state-description    [28222]    CharacterString OPTIONAL,
    ...
    event-time-stamps    [130]    SEQUENCE OF BACnetTimeStamp OPTIONAL,
    -- accessed as a BACnetARRAY
    -- accessed as a BACnetARRAY
}

```

51) ANNEX C, p. 511. In the STRUCTURED-VIEW production, 'node-type' should not be OPTIONAL.

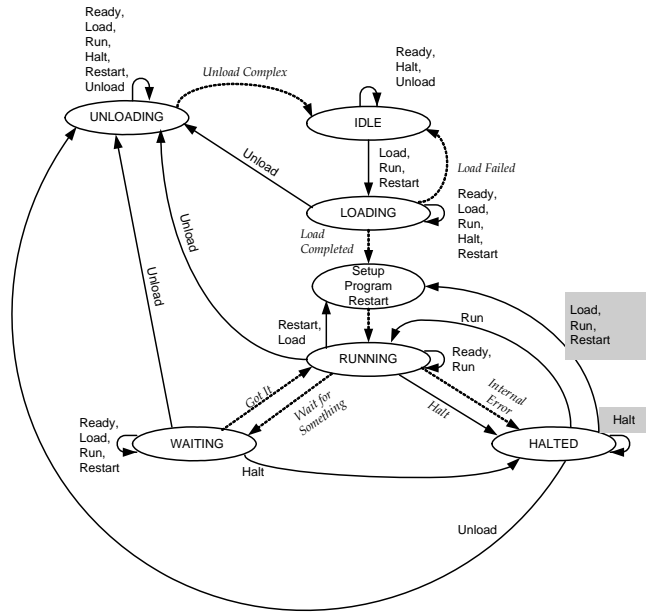
```

STRUCTURED-VIEW ::= SEQUENCE {
    ...
    node-type    [208]    BACnetNodeType OPTIONAL,
    ...
}

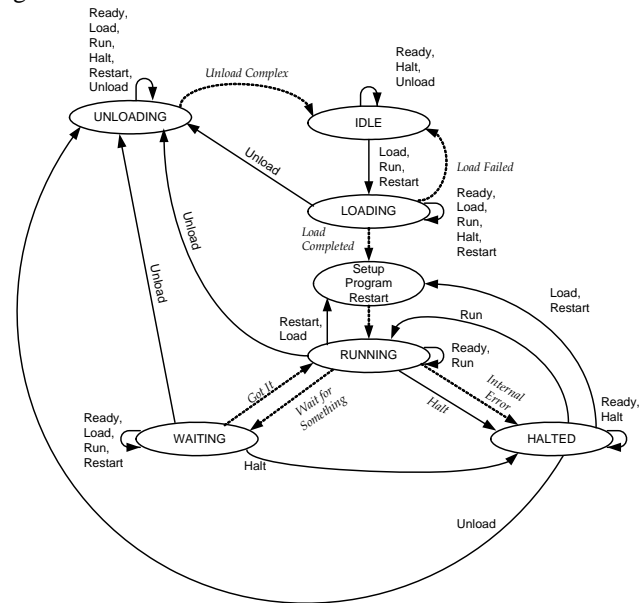
```

52) Figure 12-3, p. 234. The transitions from the HALTED state are incorrectly shown. Correct as follows:

Original Figure:



Updated Figure:



53) ANNEX A, p. 494. Addendum 135-2008l added two new device profiles but did not update the PICS.

BACnet Standardized Device Profile (Annex L):

- BACnet Operator Workstation (B-OWS)
- BACnet Advanced Operator Workstation (B-AWS)
- BACnet Operator Display (B-OD)

BACnet Building Controller (B-BC)

...

54) ANNEX A, p. 494. Addendum 135-2008g added a new data link option but did not update the PICS.

Data Link Layer Options:

...

LonTalk, (Clause 11), medium: _____

BACnet/ZigBee (ANNEX O)

Other: _____