ISO/IEC JTC 1/WG 7
Working Group on Sensor Networks

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Template for comments and secretariat observations
US NB comments on N089 1st WD ISO/IEC WD 29182-1

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1	2	(3)	4	5	(6)	(7)
MB[1]	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph/ Figure/Table/ Note** (e.g. Table 1)	**Type of com-ment[2]**	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Secretariat observations** on each comment submitted
US/1	Page iii	Item 6.4	ed	The word "user" needs to be pluralized.	Replace "Types of user" by "Types of users".	
US/2	Page iii	Item 6.9	ed	The word communication is typically used in its plural form in contexts like this.	Replace "Intra-sensor-network communication" by "Intra-sensor-network communications".	
US/3	Page iii	Item 6.10	te	Energy efficiency is a more appropriate term than power efficiency in this context. What matters is how much energy a sensor node has to expend to get certain task done. A sensor node with lower power consumption that takes much longer than another node to get certain task done consumes more energy in the final analysis.	Change the name of this subsection to "Energy Efficiency and Operating Lifetime".	
US/4	Page iii	Item 6.13	ed	Need a "-", because this is a hyphenated word.	Replace "User oriented" by "User-oriented".	
US/5	Page iv	Paragraph 5	ed	Use the correct name for WG 7.	Replace "Sensor Network" by "Sensor Networks".	
US/6	Page v	Part 2	ed	Extra word needs to be removed.	Remove the word "part" before "provides".	
US/7	Page v	Part 3	ed	It's better not to have two occurrences of "e.g." in the same sentence.	Propose alternate text: "Part 3 presents the reference architecture from various viewpoints, such as business, operational, system, technical, functional, and logical.	
US/8	Page v	Part 4	ed	Just some minor tweaks.	Propose alternate text" "Part 4 provides a description of models for various entities, such as systems, subsystems, and components with their interfaces, functional descriptions, and how they are used in the reference architecture and for implementation purposes."	
US/9	Page v	Part 5	ed	Just some minor tweaks.	Propose alternate text for the first sentence: "Part 5 provides detailed information on the interfaces among various entities in the reference architecture."	

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US/10	Page v	Part 7	ed	Just some minor tweaks. It's better not to have two occurrences of the word "interoperability".	Propose alternate text: "Part 7 provides design principles for the reference architecture that take the interoperability requirements into account."	
US/11	Page v	Last paragraph	ed	Just some minor tweaks.	Replace "the organization's own requirements for interoperability" with "any applicable interoperability requirements".	
US/12	1		ed	Missing preposition.	Insert the word "of" after "overview".	
US/13	2	Line 1	ed	The word "application" may not be the best choice.	Suggest replacing it with "use".	
US/14	4		ed	ICT stands for "Information and Communication Technologies".	Make the appropriate change.	
US/15	5	Paragraph 1	ed	Just some minor tweaks.	Suggest alternate text: "A sensor network is a system of spatially distributed sensor nodes interacting with each other and, depending on the application, with ICT infrastructures, in order to acquire, process, and provide information from/about the physical world and optionally react to such information."	
US/16	Pages 2-9		ed	The document is missing a lot of articles (a, an, the), too many to list in this document. Occasionally, there articles have been included, where they are not needed.	Suggest having the document read by a native speaker of the English language and the changes made in the MS Word version of this document with change tracking turned on.	
US/17	5	Figure 1	te	The figure shows two separate sensor networks.	Suggest breaking the figure into two parts. Figure 1a should be the lower sensor network involving a few sensors and a user. Figure 1b would then depict the more complicated architecture. The text preceding the figure needs to be appropriately revised.	
US/18	5	Figure 1	te	Information processing in a sensor network can be done in a centralized or distributed manner. In the former case, there is a central node that receives	Figure 1 needs more work to capture these possibilities. This particularly applies to the lower part of the figure, unless we assume the user and	

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				information from all sensor nodes and processes that information to deduct high-level information about some phenomenon in the physical world. In the latter case, all sensor nodes are similar and act similarly in terms of processing the information they have acquired or obtained from neighboring nodes. They collectively deduct information about the physical world through possibly many rounds of information exchange. There is also a hierarchical case with clusters of sensor nodes that collaborate locally and exchange information with other clusters through a cluster head in each cluster.	the central node are one and the same.	
US/19	Page 2	Paragraph 2, line 5 from bottom	te	It is not clear what is meant by “integrated services”.	Explain the terminology and possibly include examples.	
US/20	5	Paragraph 2, last three lines	te	There is no need to list IT companies, etc.	Suggest alternate text: “However, in some cases sensor networks may not be connected to the “Rest of the World”, which typically means the Internet or its future incarnations. In such cases, all services are provided inside the sensor network.”	
US/21	5	Paragraph 3, Line 1	ed	Minor correction.	Replace “illustrated” by “illustrates”.	
US/22	5	Paragraph 3, Line 2	ed	Text needs to be consistent with Figure 2.	Replace “modules” by “module”.	
US/23	5	Paragraph 3, Line 4	ed	If the interface between the sensor network and the “Rest of the World” is through gateways, it makes sense to state that here.	Replace “Rest of the World” with “”Rest of the World” through gateway nodes”.	
US/24	5	Paragraph 3, Line 5	ed	The word “node” needs to be pluralized.	Replace “node” by “nodes”.	

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US/25	5	Figure 2	ed	The words "sensor" and "actuator" need to be pluralized.	Replace "Sensor/Actuator" with "Sensors/Actuators".	
US/26	5	Last paragraph	ed	Various components of the node hardware have been described. The same needs to be done for "Service and basic node functions" and "Application Software Module". It would also be good to be consistent in which words need to be capitalized. The latter comment applies to the entire document.	Insert appropriate text to describe various components/functions of "Service and basic node functions" and "Application Software Module".	
US/27	6		te	There is some overlap between the topics covered in Section 6 and those covered in Section 7. It has to be decided whether this is OK or there should be a better distinction of what is a "characteristic" and what is a "general requirement".	This needs to be discussed at WG 7 meetings.	
US/28	6.1		ed	The topic covered under 6.1 is not of the same nature as others covered under 6.2, 6.3, etc.	Correct the numbering system. Perhaps the "Overview" could be numbered 6.0. Another option is to remove the word "Overview" altogether and use the text as prelude to the numbered list that follows.	
US/29	6.2	Lines 4-5	ed	Minor editorial change.	Replace "structures" , "agriculture", and "facilities" by "structural", "agricultural", and "facility", respectively.	
US/30	6.2		ed	Characterizing sensor networks as a means for improving the quality of life might be a narrow viewpoint. For example, sensor networks have certain military applications that have nothing to do with improving quality of life.	Sensor networks enable us to acquire information about the physical world and take actions to affect that world.	
US/31	6.2	Line 7	ed	Minor editorial change.	Suggest alternate text: "Some examples of data sources include ….".	
US/32	6.2	Line 10	ed	Minor editorial change.	Replace "type" by "types".	

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US/33	6.2		te	In the example given at the end of this subsection, there is no clear distinction between various cases.	Need to come up with a better example.	
US/34	6.3		te	It is not clear what application inter-networking is.	Need to improve the text and provide examples that enhance clarity.	
US/35	6.4	Line 5	ed	Minor editorial change.	Replace “result in” by “develop”. Also spell out B2B and B2C and include them in Section 4.	
US/36	6.5		te	It is not clear what the last sentence means.	Need to find better ways of describing the distinction between emerging and traditional sensor networks. It is not even clear what the latter is.	
US/37	6.6		te	Sensor networks need to be able to deal with unreliable communication links, particularly wireless ones. This is part of the nature of wireless transmissions. There has to be a distinction between wireless links connecting sensor nodes to each other and those connecting sensor nodes to gateways. While the latter are typically designed to be more robust and reliable, the former may not be robust and reliable. For example, consider sensors deployed or air-dropped in a large open field.	Revise the text according to the comments to the left.	
US/38	6.7	Line 2	te	Suggest alternate text to the right for sentence beginning with “For certain”.	“In certain applications, the output data from sensor nodes is considerably more useful if it is accompanied with the location information for where the data was acquired. In such cases, determination of the location, commonly referred to as localization, of the sensor nodes is one of the most important services that the sensor network would have to provide.”	
US/39	6.8	Lines 2-3	ed	Editorial change.	“The data from a sensor may have to be pre-processed and refined at the sensor node acquiring the data or at another sensor node.	

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					Depending on application, …".	
US/40	6.9	Line 4	ed	Minor editorial change.	Remove the word "time".	
US/41	6.9	The sentence before the last	ed	Editorial change.	"Therefore, the routing scheme and communication protocols used by the sensor network have to be designed with the throughput and latency required by the application taken into account. In certain cases, the design has to be sufficiently flexible to support a plethora of applications with different throughput and latency requirements."	
US/42	6.10		te	Need to present a better story.	Suggest alternate text: "Energy efficiency is important in many sensor networks where the sensor nodes are battery-operated and it is desirable for the network to be operational for as long as possible. In certain short-lived networks, it is not possible to change the sensor node batteries and the network would stop functioning and essentially dies when a sufficiently large number of its nodes run out of battery power. There are many ways to reduce energy consumption in sensor nodes, including using low-power and hence low-speed processors, limiting the communication range and transmission bandwidth of the radios used in each sensor node, limiting the storage size, using efficient data processing algorithms, having sensors go into sleep mode according to some schedule, etc. It may also be possible to increase the battery power available to a sensor node through some means of energy harvesting. The operating lifetime of a sensor network is determined by the nodes consuming the largest amount of power relative to their battery sizes.	

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					The lifetime is hence maximized by redistributing the tasks that have to be done by the sensor network among its nodes in such a way that no node dies significantly earlier than the others, even if such redistribution results in an increased overall power consumed by the entire network."	
US/43	6.11	Line 1	ed	Minor editorial change.	Replace "sensory" by "sensor" to be consistent with the rest of the document.	
US/44	6.11	Line 7	ed	Minor editorial change.	Replace "networks' performance" by "network performance".	
US/45	6.13	Line 4	ed	Minor editorial change.	Delete "a".	
US/46	6.13	Line 5	ed	Minor editorial change.	Replace "users" by "user".	
US/47	6.13	Line 7	ed	Minor editorial changes.	Use the plural form for "sensor" and "explosive".	
US/48	6.13	Lines 8-10	te	How does the application profile describe the benefit of the application? Through a word description or quantitatively?	The sentence needs to be expanded on.	
US/49	7.1		ed	The topic covered under 7.1 is not of the same nature as others covered under 7.2, 6.3, etc.	Correct the numbering system. Perhaps the "Overview" could be numbered 6.0. Another option is to remove the word "Overview" altogether and use the text as prelude to the numbered list that follows.	
US/50	7.1	Line 2	ed	Minor editorial change.	Use the plural form for "environment".	
US/51	7.1	Line 6	ed	Too many uses of the word "general".	Suggest replacing "general for all types of sensor applications," with "those that are common to all types of sensor applications".	
US/52	7.2	Lines 2 and 4	ed	Minor editorial change.	Use the plural form of "network" and "communication".	
US/53	7.2	Lines 5-6	ed	Minor editorial change.	Replace the sentence with "The communication	

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					range can vary from short to long depending on the communication protocol used, situation and application."	
US/54	7.4		te	The application may rely on several different types of networks but does not consist of them.	Suggested alternate text: "A sensor network may be heterogeneous in the sense that it may be comprised of several different, inter-connected, interoperable networks. Note: A sensor network application may rely on different subnetworks of a heterogeneous sensor network. Standards for interconnection and interoperability of such subnetworks have to be developed."	
US/55	7.5		te, ed	It is debatable whether sensors should be allowed to join a network they were not intended for. This poses a lot of security concerns. Aside from the above point, the text can be improved.	The issue of migration of a sensor node from one network to another needs to be discussed at WG 7 meetings. Aside from the above point, the following alternate text is suggested: "A sensor network with mobile sensor nodes shall support node mobility within the network and from one network to another. Also, a sensor network shall accept the migration of a sensor node from another network." The "Note" can stay unchanged.	
US/56	7.6		te	Wouldn't "Environmental Monitoring" be a more appropriate term? It's more commonly used than "Observation of the environment".	This needs to be discussed at WG 7 meetings.	
US/57	7.7	Line 4	ed	Need to be consistent with terminology used earlier in the document.	Replace "operation life time" with "operating lifetime".	
US/58	7.8		ed	A better example can be provided, or one can leave	Spell out QoS and include it in Section 4.	

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				it in general terms.	Suggested alternate text for 3rd sentence: "For example, detection and notification of fire in certain locations, e.g. a hospital nursery, is time-critical and needs to be done reliably and with low latency." The "NOTE" at the end of the subsection is now redundant.	
US/59	7.9		te	There is a need to distinguish between "reliability", "robustness", "resilience", and "fault-tolerance".	This needs to be discussed at WG 7 meetings. The "NOTE" at the end should be removed altogether.	
US/60	7.10		te	The description needs to be expanded.	Suggest adding the following text at the end: "There are many ways in which a network can be scalable, including but not limited to the following: number of nodes, per area density of nodes, volume of data traffic that needs to be communicated, mobility, and multiplicity/frequency of events under surveillance."	
US/61	7.11	Last sentence	te	There are other aspects of security that deserve documenting here.	Suggested alternate text: "….., such as malicious acts to disrupt the operation of the sensor network, protection against ….".	
US/62	7.13		te	It is not clear what is meant by "identification" in the last sentence.	The sentence needs to be expanded upon.	
US/63	7.17		ed	The "NOTE" at the end of this subsection needs to be removed altogether.	Delete "NOTE: ….".	
US/64	7.18		ed	The text can be improved.	Suggested alternate text: "As sensor networks are generally deployed as stub networks, i.e. networks that have no	

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					knowledge of other networks and send their non-local traffic to other networks through a few known paths , IDs for sensor nodes in the network may be allocated by a coordinator in the sensor network considering the application and service types. Alternatively, the nodes could have IP-like global addresses along with special naming mechanisms for the network services. USN applications ….". It is necessary to describe what "temp_etri_x36y30" and the other sensor ID mean, even though they may look obvious to the editors of this document. The second bullet is exactly the same as the first one and hence should be removed. The "NOTE" is not consistent with the preceding text.	

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US/65	7.19		ed	Editorial changes.	Replace "networks. E.g. bootstrapping and Neighbor" with "networks. For example, bootstrapping and neighbor". Suggested alternate text for first bullet: "Control messages in sensor networks are required to be secure and should not be perceived as a burden or overhead even in low-power sensor networks." Once again, the "NOTE" should be removed altogether.	
US/66	7.20		ed	It is preferable to remove "Lightweight" from the title of this subsection but emphasize the fact that routing protocols used in sensor networks are sometimes required to be lightweight.	Can "Lightweight" be removed from the title, or does it come from the ITU-T document? Suggested alternate text for first sentence: "As sensor networks may have special requirements on energy efficiency and data-oriented communications, the following requirements may have to be placed on the routing protocol used by the network:" The references to "USN applications" after bullet 1 and before the last bullet need to be removed in light of the notes in many previous subsections. MP2P, P2MP, and P2P need to be spelled out and included in Section 4. Finally, the "NOTE" at the end of this subsection needs to be removed altogether.	

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