Course Title: HDS-1R

Module 1

Module Title: HDS-1R - INTRODUCTION

Storyboard Document

Version 1
Date: 25th May, 2008

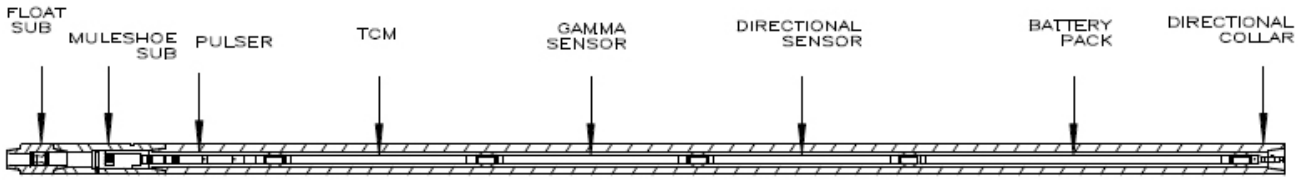
Version History	
Version 1	First version released to Pathfinder on XXth XXXXX 2008

Course: HDS-1R	
Module 0: COURSE INTRODUCTION – HDS-1R	
Course Overview	**Page:** C01_L00_S01
On-screen Text:	**Visualization Notes (Static – LCMS):**
Course Introduction Welcome to this course on the PathFinder HDS-1R tool. During the duration of this six-module course on the HDS-1R tool you will be instructed on its structure and components as well as how to run a job with it. At the end of each module, there will be a very short ungraded quiz. At the end of the entire course, there will be a comprehensive, graded online assessment. In addition, after completing both this course and its online assessment, you will take part in a half-day long hands-on, graded practical: The topics each of the six modules will cover include • HDS-1R - INTRODUCTION • HDS-1R – TOOL PREPARATION • HDS-1R – RIG FLOOR PROCEDURES • HDS-1R – PROCEDURES FOR RUNNING JOBS • HDS-1R – WIRELINE GEAR & PROCEDURES • HDS-1R – WIRELINE UNIT OPERATIONS While going through the course, you will be required to answer questions that will test your knowledge of its content. To begin the first module, click the **Next** button.	Show the standard module introduction page. In sync with the audio narrating the bulleted items, show a collage of images depicting the Wireline Unit with the help of some examples.
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Course: HDS-1R	
Module 1: HDS-1R - INTRODUCTION	
Module Overview	**Page:** M01_L01_S01
On-screen Text:	**Visualization Notes (Static – LCMS):**
Module Introduction Welcome to "**MODULE 1:** HDS-1R – INTRODUCTION", the first module on the PathFinder HDS-1R tool. During the duration of this module, you will be instructed on the HDS-1R tool's structure and components. At the end of the module, there will be a comprehensive assessment. The lessons in this module will cover: 1. HDS-1R INTRODUCTION 2. HDS-1R COMPONENTS 3. HDS-1R DRILL STRING While going through the module, you will be required to answer questions at the end of each lesson that will test your knowledge of its content. To begin the first module, click the **Next** button.	Show the standard module introduction page. In sync with the audio narrating the bulleted items, show a collage of images depicting the HDS-1R with the help of some examples.
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Introduction	
Page Title: Introduction to the HDS-1R	**Page:** M01_L01_S02
On-screen Text:	**Visualization Notes (Static – LCMS):**
Introduction to the HDS-1R When the engineers at PathFinder set out to design the Pathfinder HDS1R, they did so out of a need from our clients for a reliable, retrievable directional/gamma tool that was simple and easy to assemble and use in the field and inexpensive to maintain. PathFinder engineers had to use a minimum number of BHA components and mechanical configurations while also providing for an upgrade path from HDS-1 to HDS-1R. At the same time, a common surface system for both the HDS-1 and HDS-1R platforms had to be designed. Lastly, the HDS1R had to keep both its technology and operations support internal to PathFinder. Using components from pre-existing PathFinder MWD systems, the HDS-1R was created. It harnesses features found in the HDS-1 including the same pressure barrels and intermediate plugs, gamma tool design, telemetry encoding scheme, rigsite programming capabilities, memory capability, key and sleeve orientation, real-time vibration monitoring, standard monel sizes and battery pack construction and monitoring. The HDS-1R also utilizes features from Thomas Tool's Tracker – including its Pulser, Muleshoe subs, Collapsible centralizers, and Snubber assemblies. Also, both the HDS-1 and HDS-1R are compatible with PathFinder's RX4 surface system. To further explore the HDS-1R tool, click the **Next** button.	**3D animation:** On entry to the screen, the screen is faded out and blank. An HDS-1 tool "materializes" and various tool components start flying off of the HDS-1 and start to "construct" an HDS-1R tool below the HDS-1. As the HDS-1R starts to come together out of these components, it slowly starts to spin around 360 degrees so that it can be seen from all angles. Finally, the HDS-1 "dematerializes" and a Tracker tool "materializes" above the HDS-1R and parts from it also fly off of it and onto the HDS-1R tool, aiding in the HDS-1R's construction. Once all its parts have been incorporated into the HDS-1R and the HDS-1R's construction has been completed, The Tracker tool finally "dematerializes." The completed HDS-1R tool zooms in so that it is bigger and takes up most of the space diagonal on the screen while rotating to a sideways shot at which point, it freezes and stops moving. The HDS-1R now sits diagonal across the screen with its back end up and pointing to the upper right corner of the screen and its front pointed down and pointing to the lower left corner of the screen. This frozen, sideways shot of the HDS-1R will be used for the remainder, rollover portion of the module.
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: Lesson Introduction	**Page:** M01_L02_S01
On-screen Text:	**Visualization Notes (Static – LCMS):**
Lesson Introduction There are several important components featured in the HDS-1R tool. After completing this lesson, you will be able to: - Recognize the different HDS-1R components - Explain what each one does. To further explore the components that make up the HDS-1R, click the **Next** button.	Standard objective screen. The image shown here would be that of a checklist with certain points ticked.
Additional Notes:	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: HDS-1R Components	**Page:** M01_L02_S02
On-screen Text:	**Visualization Notes (Static – LCMS):**
HDS-1R Components To learn more about the components of the HDS-1R tool, simply rollover each component. Text and graphics will pop up with additional information.	**Interactive Flash Rollover** The completed HDS-1R tool is zoomed in so that it takes up most of the space diagonal across the screen with its back end up and pointing to the upper right corner of the screen and its front pointed down and pointing to the lower left corner of the screen. This frozen, sideways shot of the HDS-1R will be used for the remainder, rollover portion of the module. The illustration below is an approximation of the real graphic, which will be rendered in 3D as realistic looking as possible Rollovers in Flash are built – so that the student can roll over the HDS-1R tool and learn all about its various components in an interactive and intuitive way. Each rollover will include more in depth text and zoomed in photos and illustrations of the specific component being featured. Where applicable, there will be a “For More Information” button that, when pushed, will play a video clip or an animation featuring additional information. 

Additional Notes:
The voice-over audio should be identical to the on-screen text.

Module 1: HDS-1R - INTRODUCTION

Lesson Title: HDS-1R Components

Page Title: ROLLOVERS - ALL **Page:** M01_L02_S03

On-screen Text:	Visualization Notes: (Animation - LCMS)

Tracker Pulser
The pulser is the telemetry system used to communicate to the surface. The pulser converts the data stream created by the Pulser Driver into a series of positive pressure pulses in the mud volume by use of a sophisticated valve. The pulses are detected at the surface and data is decoded from the pulse stream. (There will be a "For More Information" button where, when pushed, will play Terry Frith's video regarding the Pulser's Design and Function)

Telemetry Control Module
The telemetry control module (TCM) controls the sensor data acquisition and controls the actuation of the pulser motor via the pulser driver. An accelerometer serves as a vibration sensor to provide an indication of the lateral 'g' forces being exerted on the toolstring. This data provides advanced warning of possible tool failure due to excessive shock and vibration. The TCM also provides the flow monitoring functions via the Tracker Electronic Flow Sensor(EFS).

Battery Pack
The battery pack supplies all power to the HDS-1R system. Internally, the battery pack is made up of 2 primary battery modules. Each battery stick consists of 7 DD cell sticks. A battery monitor/switch (BMS) monitors the voltage level of the battery modules. The BMS also monitors the total amp-hours supplied by both modules. Amp-hour data are available for real-time transmission uphole. Note: A single stick configuration is also available.

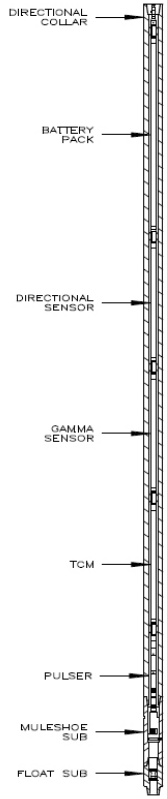
Directional Sensor
The directional sensor is the survey module that provides to the driller the instantaneous direction (attitude) of the borehole. It also provides tool face angle (the direction that a bent section of a sub is pointing). The sensor also provides gravity-based measurements, such as inclination, using accelerometers and magnetic-based measurements, such as azimuth, using magnetometers.

Gamma Sensor (optional)
The universal gamma sensor (UGS) is used for formation identification in the wellbore by detecting gamma rays. Gamma rays are produced during the radioactive decay process to relieve atoms of excess energy. The main sources of radioactivity in the downhole environment come from thorium, potassium, and uranium. The measurement of the radioactivity allows for formation identification and is mainly used for depth correlation purposes.

Directional Collar
The directional collar provides a concentrated weight on the bit at the bottom of the hole. It also provides a large mass of steel with large tool joints capable of withstanding tensional, compressional, and torsional forces imposed during drilling operations. The directional collar is manufactured out of non-magnetic stainless steel to avoid affecting magnetic-based directional measurements. This may or may not be a PathFinder component, limitations are I.D. of 2.25 to 3-1/4 inches.

Muleshoe Sub
The Muleshoe sub houses the Muleshoe sleeve. This sub has two purposes. First it allows the tool to be oriented and prevents the tool from rotating. Second it contains the orifice by which the pulser generates pulses by causing a flow restriction.

Float Sub
The float sub is used to house the float valve. The float valve prevents backflow of the drilling fluid, and prevents foreign material from entering the Muleshoe orifice area which could cause the tool to become unseated from the Muleshoe sleeve while tripping in the hole.



Additional Notes:
The voice-over audio should be identical to the on-screen text for all rollovers.

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER - TRACKER PULSER	**Page:** M01_L02_S03a
On-screen Text:	**Visualization Notes: (Interactive - LCMS)**
Tracker Pulser The pulser is the telemetry system used to communicate to the surface. The pulser converts the data stream created by the Pulser Driver into a series of positive pressure pulses in the mud volume by use of a sophisticated valve. The pulses are detected at the surface and data is decoded from the pulse stream. (There will be a "For More Information" button where, when pushed, will play Terry Frith's video regarding the Pulser's Design and Function)	Illustrations and/or Photo(s) of TRACKER PULSER
Additional Notes: The voice-over audio should be identical to the on-screen text for all rollovers.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – TELEMETRY CONTROL MODULE	**Page:** M01_L02_S03b
On-screen Text:	**Visualization Notes: (Animation + Interaction - LCMS)**
Telemetry Control Module The telemetry control module (TCM) controls the sensor data acquisition and controls the actuation of the pulser motor via the pulser driver. An accelerometer serves as a vibration sensor to provide an indication of the lateral 'g' forces being exerted on the toolstring. This data provides advanced warning of possible tool failure due to excessive shock and vibration. The TCM also provides the flow monitoring functions via the Tracker Electronic Flow Sensor(EFS).	Illustrations and/or Photo(s) of TELEMETRY CONTROL MODULE
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – BATTERY PACK	**Page:** M01_L02_S03c
On-screen Text:	**Visualization Notes: (Animation + Interaction - LCMS)**
Battery Pack The battery pack supplies all power to the HDS-1R system. Internally, the battery pack is made up of 2 primary battery modules. Each battery stick consists of 7 DD cell sticks. A battery monitor/switch (BMS) monitors the voltage level of the battery modules. The BMS also monitors the total amp-hours supplied by both modules. Amp-hour data are available for real-time transmission uphole. Note: A single stick configuration is also available.	Illustrations and/or Photo(s) of BATTERY PACK
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – DIRECTIONAL SENSOR	**Page:** M01_L02_S03d
On-screen Text:	**Visualization Notes (Static – LCMS):**
Directional Sensor The directional sensor is the survey module that provides to the driller the instantaneous direction (attitude) of the borehole. It also provides tool face angle (the direction that a bent section of a sub is pointing). The sensor also provides gravity-based measurements, such as inclination, using accelerometers and magnetic-based measurements, such as azimuth, using magnetometers.	Illustrations and/or Photo(s) of DIRECTIONAL SENSOR
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – GAMMA SENSOR (OPTIONAL)	**Page:** M01_L02_S03e
On-screen Text:	**Visualization Notes: Static - LCMS**
Gamma Sensor (optional) The universal gamma sensor (UGS) is used for formation identification in the wellbore by detecting gamma rays. Gamma rays are produced during the radioactive decay process to relieve atoms of excess energy. The main sources of radioactivity in the downhole environment come from thorium, potassium, and uranium. The measurement of the radioactivity allows for formation identification and is mainly used for depth correlation purposes.	Illustrations and/or Photo(s) of GAMMA SENSOR
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – DIRECTIONAL COLLAR	**Page:** M01_L02_S03f
On-screen Text:	**Visualization Notes: Static - LCMS**
Directional Collar The directional collar provides a concentrated weight on the bit at the bottom of the hole. It also provides a large mass of steel with large tool joints capable of withstanding tensional, compressional, and torsional forces imposed during drilling operations. The directional collar is manufactured out of non-magnetic stainless steel to avoid affecting magnetic-based directional measurements. This may or may not be a PathFinder component, limitations are I.D. of 2.25 to 3-1/4 inches.	Illustrations and/or Photo(s) of DIRECTIONAL COLLAR
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – MULESHOE SUB	**Page:** M01_L02_S03g
On-screen Text:	**Visualization Notes: Static - LCMS**
Muleshoe Sub The Muleshoe sub houses the Muleshoe sleeve. This sub has two purposes. First it allows the tool to be oriented and prevents the tool from rotating. Second it contains the orifice by which the pulser generates pulses by causing a flow restriction.	Illustrations and/or Photo(s) of MULESHOE SUB
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – FLOAT SUB	**Page:** M01_L02_S03h
On-screen Text:	**Visualization Notes: Static - LCMS**
Float Sub The float sub is used to house the float valve. The float valve prevents backflow of the drilling fluid, and prevents foreign material from entering the Muleshoe orifice area which could cause the tool to become unseated from the Muleshoe sleeve while tripping in the hole.	Illustrations and/or Photo(s) of FLOAT SUB
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – RUNNING GEAR	**Page:** M01_L02_S03i
On-screen Text:	**Visualization Notes: Static - LCMS**
Running Gear Running gear includes the outside components of the MWD probe toolstring, such as: • Intermediate plugs • Collapsible centralizers • Bebro receptacles • Clamps • Pressure barrels These components connect the probe modules to make up the toolstring, stabilize the toolstring in the collar bore, and protect the probe assemblies from the wellbore environment.	Illustrations and/or Photo(s) of RUNNING GEAR (BOX?)
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – INTERMEDIATE PLUGS	**Page:** M01_L02_S03j
On-screen Text:	**Visualization Notes: Static - LCMS**
Intermediate Plugs Intermediate plugs are used to mate (mechanically and electrically) pressure barrel sections and stabilize the toolstring within the collar bore. The mechanical connection is a threaded joint while the electrical connection is a rotatable slip-ring arrangement that engages as the mechanical joint is made up. Clamps secure the probe sections to the intermediate plugs. Each intermediate plug is serialized with 3/32-inch engraved lettering in the format TIP-2XXX. This allows history cards to be kept on each intermediate plug to denote revision level, replaced parts, repaired parts, observations, etc. Intermediate plugs come in two different varieties. The standard intermediate plug is used to mate the pressure barrels sections together between the various probe assemblies. The lower intermediate plug is used in only one location to mate the TCM/Driver/EFS probe assembly to the tracker pulser. The plugs are constructed in similar fashion except for the caps, which have different thread profiles and feedthru rods to prevent them from being interchangeable. The standard intermediate plug cap is a four-conductor male and the lower intermediate plug cap is a seven-conductor female. Both varieties use the same collapsible/replaceable centralizer(s) and mandrel section.	Illustrations and/or Photo(s) of INTERMEDIATE PLUGS
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – COLLAPSIBLE CENTRALIZERS	**Page:** M01_L02_S03k
On-screen Text:	**Visualization Notes: Static - LCMS**
Collapsible Centralizers Collapsible centralizers have four rubber blades to stabilize the probe sections within the directional collar and collapse when travelling through different pipe internal diameters. These collapsible centralizers slip over the intermediate-plug body. Centralizers may be trimmed to fit different I.D. sizes using the trimming guide.	Illustrations and/or Photo(s) of COLLAPSIBLE CENTRALIZERS
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – BEBRO RECEPTACLES	**Page:** M01_L02_S03l
On-screen Text:	**Visualization Notes: Static - LCMS**
Bebro Receptacle Assembly The Bebro receptacle assembly provides a means to electrically mate sections of the HDS-1R toolstring by allowing rotation during the make-up process to intermediate plugs and to provide a means to mechanically compensate for tolerances due to machining, thermal, pressure, stack, and other tolerance buildups. The unrestrained length of the assembly is 2.954 inches, and the compressed length is 2.492 inches when preloaded to about 100 pounds. A short clamp is required to attach the Bebro assembly to the probe section.	Illustrations and/or Photo(s) of BEBRO RECEPTACLES
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

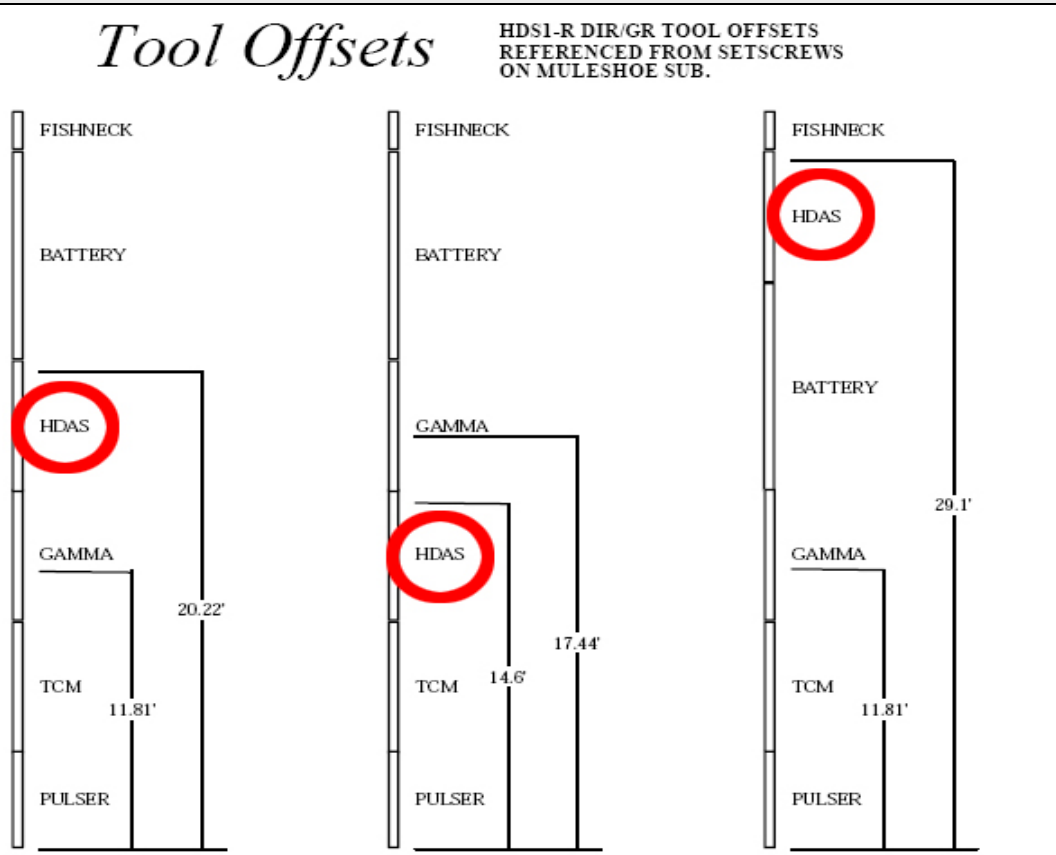
Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – CLAMPS	**Page:** M01_L02_S03m
On-screen Text:	**Visualization Notes: Static - LCMS**
Clamps The HDS-1R clamp is designed to optimize length and overhead associated with clamping modules. The clamps consist of two red anodized clamp halves that are used in all clamping locations except on top of the gamma sensor. Four socket head cap screws are required to assemble the halves.	Illustrations and/or Photo(s) of CLAMPS
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: ROLLOVER – PRESSURE BARRELS	**Page:** M01_L02_S03n
On-screen Text:	**Visualization Notes: Static - LCMS**
Pressure Barrels Pressure barrels are the outer pressure vessels protecting the modules from the wellbore environment. They are made of high-strength, austenitic stainless steel that provides a combination of corrosion resistance and strength not found in any other material commercially available in its price range. This steel has good mechanical properties at both elevated and sub-zero temperatures. Unlike many other austenitic stainless steels, Nitronic 50 does not become magnetic when cold worked.	Illustrations and/or Photo(s) of PRESSURE BARRELS
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R Components	
Page Title: LESSON SUMMARY	**Page:** M01_L02_S04
On-screen Text:	**Visualization Notes (Static – LCMS):**
Lesson Summary Now let's summarize what you've just learned. The HDS-1R is made up of a number of important components. They are: Tracker Pulser Telemetry Control Module Battery Pack Directional Sensor Gamma Sensor (optional) Directional Collar Muleshoe Sub Float Sub Running Gear • Intermediate plugs • Collapsible centralizers • Bebro receptacles • Clamps • Pressure barrels This concludes the lesson on *HDS-1R Components*.	Standard objective screen. The image shown here would be that of a checklist with certain points ticked.
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: Lesson Introduction	**Page:** M01_L03_S01
On-screen Text:	**Visualization Notes (Static – LCMS):**
Lesson Introduction There are several ways a HDS-1R Drillstring can be configured. After completing this lesson, you will be able to: - Recognize the different HDS-1R Drillstrings - Explain Why Each One is Used.	Standard objective screen. The image shown here would be that of a checklist with certain points ticked.
Additional Notes:	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: Introduction to HDS-1R Drillstrings	**Page:** M01_L03_S02

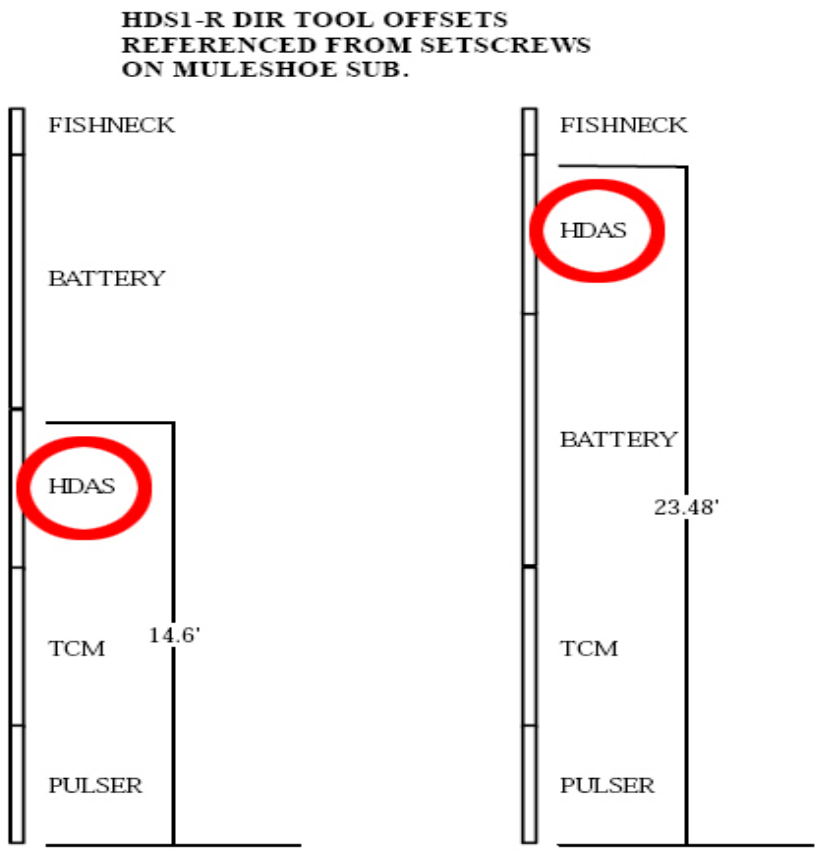
On-screen Text:	**Visualization Notes (Static – LCMS):**
Introduction to HDS-1R Drillstrings There are five different ways a HDS-1R Drillstring can be configured. There are 3 different HDS-1R Drillstring configurations that include a Gamma tool and there are 2 configurations for the drillstring without one. In each case, the drillstring requires a different spacing between the tools, mainly, the spacing of the HDAS, and the Gamma tool from the drill bit. This need for different spacing between the HDAS and Gamma tools has a lot to do with magnetic interference – which can be caused by placing tools such as the Gamma tool too close to other tools in the string. Usually, the MWD/LWD Field Engineer will get instructions regarding drillstring configuration and non-magnetic spacing considerations from each job's job sheet. Some jobs require the HDAS to be situated above the Gamma tool, while others require the HDAS to be placed below it. To learn more about the different ways the HDS-1R tool can be configured, please roll over the illustration for more information.	

Additional Notes:
The voice-over audio should be identical to the on-screen text.

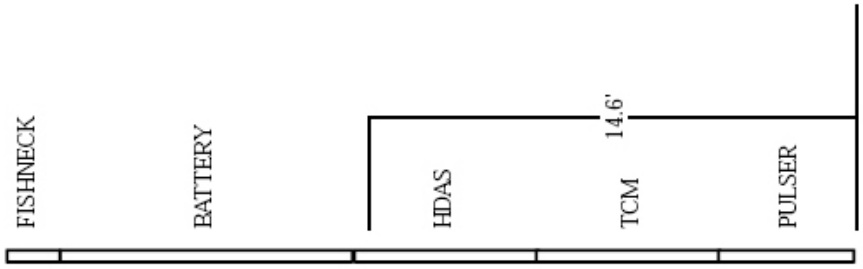
Module 1: HDS-1R - INTRODUCTION

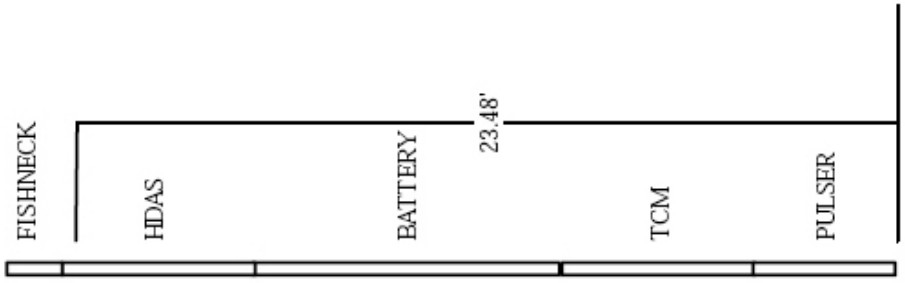
Lesson Title: HDS-1R DRILLSTRINGS

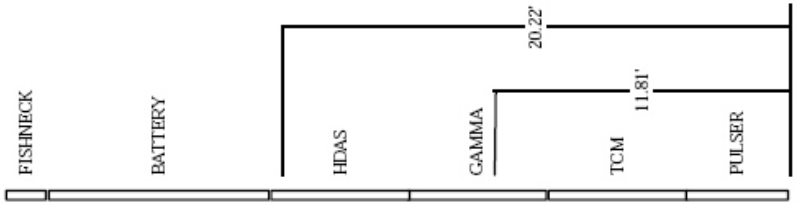
Page Title: Introduction to HDS-1R Drillstrings | **Page:** M01_L03_S03

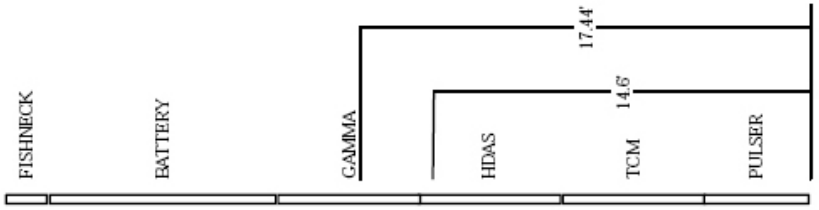
On-screen Text:	Visualization Notes: (Animation - LCMS)
Introduction to HDS-1R Drillstrings There are 2 configurations for the drillstring without a Gamma tool. In this case, the drillstring requires a different spacing between the HDAS from the drill bit. This need for different spacing between the HDAS and drill bit has a lot to do with magnetic interference. Usually, the MWD/LWD Field Engineer will get instructions regarding drillstring configuration and non-magnetic spacing considerations from each job's job sheet. Some jobs require a Gamma tool, while others will be run without one – it is up to the choice of the client. In the case of jobs run without a Gamma tool, the HDAS can either be situated above or below the battery. To learn more about the different ways the HDS-1R tool can be configured, please roll over the illustration for more information.	

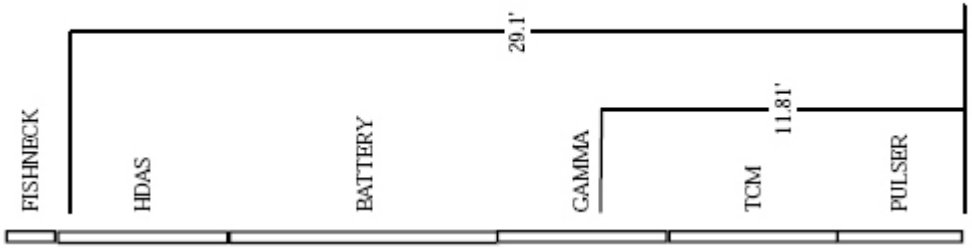
Additional Notes:
The voice-over audio should be identical to the on-screen text.

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: ROLLOVER – DRILLSTRING 1	**Page:** M01_L03_S03a
On-screen Text:	**Visualization Notes: (Animation + Interaction - LCMS)**
DRILLSTRING 1 This HDS-1R Drillstring configuration does not feature a Gamma tool. The drillstring requires a 14.6 foot spacing between the HDAS and the drillbit. In this string, the HDAS tool is situated BELOW the battery.	
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: ROLLOVER – DRILLSTRING 2	**Page:** M01_L03_S03b
On-screen Text:	**Visualization Notes: (Animation + Interaction - LCMS)**
DRILLSTRING 2 This HDS-1R Drillstring configuration does not feature a Gamma tool. The drillstring requires a 23.48 foot spacing between the HDAS and the drillbit. In this string, the HDAS tool is situated ABOVE the battery.	
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: ROLLOVER – DRILLSTRING 3	**Page:** M01_L03_S03c
On-screen Text:	**Visualization Notes: (Animation + Interaction - LCMS)**
DRILLSTRING 3 This HDS-1R Drillstring configuration includes a Gamma tool. The drillstring requires a 20.22 foot spacing between the HDAS and the drillbit, and a 11.81 foot spacing from the Gamma tool to the drill bit. In this string, the HDAS tool is situated right above the Gamma tool.	
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: ROLLOVER – DRILLSTRING 4	**Page:** M01_L03_S03d
On-screen Text:	**Visualization Notes: (Animation + Interaction - LCMS)**
DRILLSTRING 4 This HDS-1R Drillstring configuration includes a Gamma tool. The drillstring requires a 14.6 foot spacing between the HDAS and the drillbit, and a 17.44 foot spacing from the Gamma tool to the drill bit. In this string, the HDAS tool is situated right below the Gamma tool.	
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: ROLLOVER – DRILLSTRING 5	**Page:** M01_L03_S03e
On-screen Text:	**Visualization Notes: (Animation + Interaction - LCMS)**
DRILLSTRING 5 This HDS-1R Drillstring configuration includes a Gamma tool. The drillstring requires a 29.1 foot spacing between the HDAS and the drillbit, and an 11.81 foot spacing from the Gamma tool to the drill bit. In this string, the HDAS tool is situated near the top of the drillstring, above the Gamma tool with the battery between them.	
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: HDS-1R DRILLSTRINGS	
Page Title: Lesson Summary	**Page:** M01_L03_S07
On-screen Text:	**Visualization Notes (Static – LCMS):**
Lesson Summary: Now Let's summarize what you've just learned. You learned that there are five ways a HDS-1R Drillstring can be configured. There are 3 different HDS-1R Drillstring configurations that include a Gamma tool and there are 2 configurations for the drillstring without one. In each case, the drillstring requires a different spacing between the tools, mainly, the spacing of the HDAS, and the Gamma tool from the drill bit. This is due primarily to avoid magnetic interference between tools. This concludes the lesson on *HDS-1R Drillstrings*.	Standard objective screen. The image shown here would be that of a checklist with certain points ticked.
Additional Notes: The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R – INTRODUCTION	
Lesson Title: HDS-1R INTRODUCTION	
Page Title: What Have You Learned?	**Page:** M01_Q01_S01
On-screen Text:	**Visualization Notes: Static - LCMS**
What Have You Learned Test your understanding of the content presented in this module. On some questions, you will have more than one chance to answer a question correctly as well as receive feedback for your responses.	Show the standard lesson transition graphic
Text Reference for Visualization:	
The voice-over audio should be identical to the on-screen text.	

Module 1: HDS-1R - INTRODUCTION				
Lesson Title: Self Test				
N/A				**Page:** M01_Q01_S02
Question Stem: Match the Cardinal directions to their Azimuth bearings.				
North	A		A	0 degrees
South	B		C	90 degrees
East	C		D	180 degrees
West	D		B	270 degrees
				45 degrees
Prompt Text: Drag the option on the left into the appropriate blank area on the right and then click **Submit**.				
First Attempt				
Incorrect: The options that you have selected are incorrect. To go through the content related to this question, click **Recheck**.				
Correct: That's correct!				
Partial Feedback: Some of the options that you have selected are incorrect. To go through the content related to this question, click **Recheck**.				
Note to Developer: When the learner answers the question incorrectly for the first time, replace the **Try Again** button with the **Recheck** button. When the learner clicks the **Recheck** button, take the learner to **M02_L01_S03**. After the audio of the page is complete, display the **Try Again** button on the page. This button should take the learner back to this question.				
Second Attempt:				
Incorrect: That is incorrect. The correct answers are displayed for you.				
Correct: That's correct!				
Partial Feedback: That's partially correct. The correct answers are displayed for you.				

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: Self Test	
N/A	**Page:** M01_Q01_S03
Question Stem: What does a Quadrant refer to?	
Option A: The horizontal line passing through the origin.	
Option B: The vertical line passing through the origin.	
Option C: One of the four sections created by the horizontal and vertical axis lines.	
Option D: The point where the axis lines meet.	
Prompt Text: Choose the correct option and then click **Submit**.	
Answer: D	
First Attempt	
Correct Feedback: That's correct! A Quadrant refers to the point where the axis lines meet.	
Incorrect Feedback: The option you selected is incorrect. To go through the content related to this question, click **Recheck**.	
Note to Developer: When the learner answers the question incorrectly for the first time, replace the **Try Again** button with the **Recheck** button. When the learner clicks the **Recheck** button, take the learner to **M02_L01_S06**. After the audio of the page is complete, display the **Try Again** button on the page. This button should take the learner back to this question.	
Second Attempt	
Correct Feedback: That's correct! A Quadrant refers to the point where the axis lines meet.	
Incorrect Feedback: That's incorrect. A Quadrant refers to the point where the axis lines meet.	

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: Self Test	
N/A	**Page:** M01_Q01_S04
Question Stem: Azimuth bearing uses North, or 0 degrees, as the reference direction. So, if you are on a heading of 92 degrees, it means you are heading 182 degrees clockwise of due north.	
Option A: True.	
Option B: False.	
Prompt Text: Choose the correct option and then click **Submit**.	
Answer: B	
First Attempt	
Correct Feedback: That's correct! Azimuth bearing uses North, or 0 degrees, as the reference direction. All directions are measured from this reference direction. So, if you are on a heading of 92 degrees, it means you are heading 92 degrees clockwise of due north.	
Incorrect Feedback: The option you selected is incorrect. Azimuth bearing uses North, or 0 degrees, as the reference direction. All directions are measured from this reference direction. So, if you are on a heading of 92 degrees, it means you are heading 92 degrees clockwise of due north	

Module 1: HDS-1R - INTRODUCTION				
Lesson Title: Self Test				
N/A				**Page:** M01_ Q01_S05
Question Stem: Match the following Azimuth bearings to their Quadrant bearings.				
178 degrees	A		D	North 90 degrees East or South 90 degrees East
88 degrees	B		E	South –53 degrees West
317 degrees	C		A	South 2 degrees East
90 degrees	D		C	North –43 degrees West
233 degrees	E		B	North 88 degrees East
				South 32 degrees West
Prompt Text: Drag the option on the left into the appropriate blank area on the right and then click **Submit**.				
First Attempt				
Incorrect: The options that you have selected are incorrect. To go through the content related to this question, click **Recheck**.				
Correct: That's correct!				
Note to Developer: When the learner answers the question incorrectly for the first time, replace the **Try Again** button with the **Recheck** button. When the learner clicks the **Recheck** button, take the learner to **M02_L02_S**. After the audio of the page is complete, display the **Try Again** button on the page. This button should take the learner back to this question.				
Partial Feedback: Some of the options that you have selected are incorrect. To go through the content related to this question, click **Recheck**.				
Second Attempt				
Incorrect: That is incorrect. The correct answers are displayed for you.				
Correct: That's correct!				
Partial Feedback: That's partially correct. The correct answers are displayed for you.				

Module 1: HDS-1R - INTRODUCTION				
Lesson Title: Self Test				
N/A				**Page:** M01_ Q01_S06
Question Stem: Match the following Quadrant bearings to their Azimuth bearings.				
North 32 degrees East	A		B	231 degrees
South 51 degrees West	B		A	32 degrees
South 63 degrees East	C		C	117 degrees
North 9 degrees East	D		E	304 degrees
North 56 degrees West	E		D	9 degrees
				110 degrees
Prompt Text: Drag the option on the left into the appropriate blank area on the right and then click **Submit**.				
First Attempt				
Incorrect feedback: The options that you have selected are incorrect. To go through the content related to this question, click **Recheck**.				
Correct feedback: That's correct!				
Partial Feedback: Some of the options that you have selected are incorrect. To go through the content related to this question, click **Recheck**.				
Note to Developer: When the learner answers the question incorrectly for the first time, replace the **Try Again** button with the **Recheck** button. When the learner clicks the **Recheck** button, take the learner to **M02_L02_S04**. After the audio of the page is complete, display the **Try Again** button on the page. This button should take the learner back to this question.				
Second Attempt				
Incorrect feedback: That is incorrect. The correct answers are displayed for you.				
Correct feedback: That's correct!				
Partial Feedback: That's partially correct. The correct answers are displayed for you.				

Module 1: HDS-1R - INTRODUCTION	
Lesson Title: Self Test	
N/A	**Page:** M01_ Q01_S07
Question Stem: In the rectangular coordinate system, the horizontal line is called the Y-axis and the vertical line, the X-axis.	
Option A: True	
Option B: False	
Prompt Text: Choose the correct option and then click **Submit**.	
Answer: B	
First Attempt	
Correct Feedback: That's correct! In the rectangular coordinate system, the horizontal line is called the X-axis, and the vertical line is called the Y-axis.	
Incorrect Feedback: The option you selected is incorrect. In the rectangular coordinate system, the horizontal line is called the X-axis, and the vertical line is called the Y-axis.	

Module 1: HDS-1R - INTRODUCTION	
	Page: M01_ Q01_S08
On-screen Text:	**Visualization Notes: Static**
Module Summary You have completed the module *Introduction to the HDS-1R.* In this module, you learned about o HDS-1R INTRODUCTION o HDS-1R COMPONENTS o HDS-1R DRILL STRING	Standard module summary screen. The image shown here would be that of a checklist with certain points ticked. Use progressive disclosure to display the points.
Additional Notes: The voice-over audio should be identical to the on-screen text.	