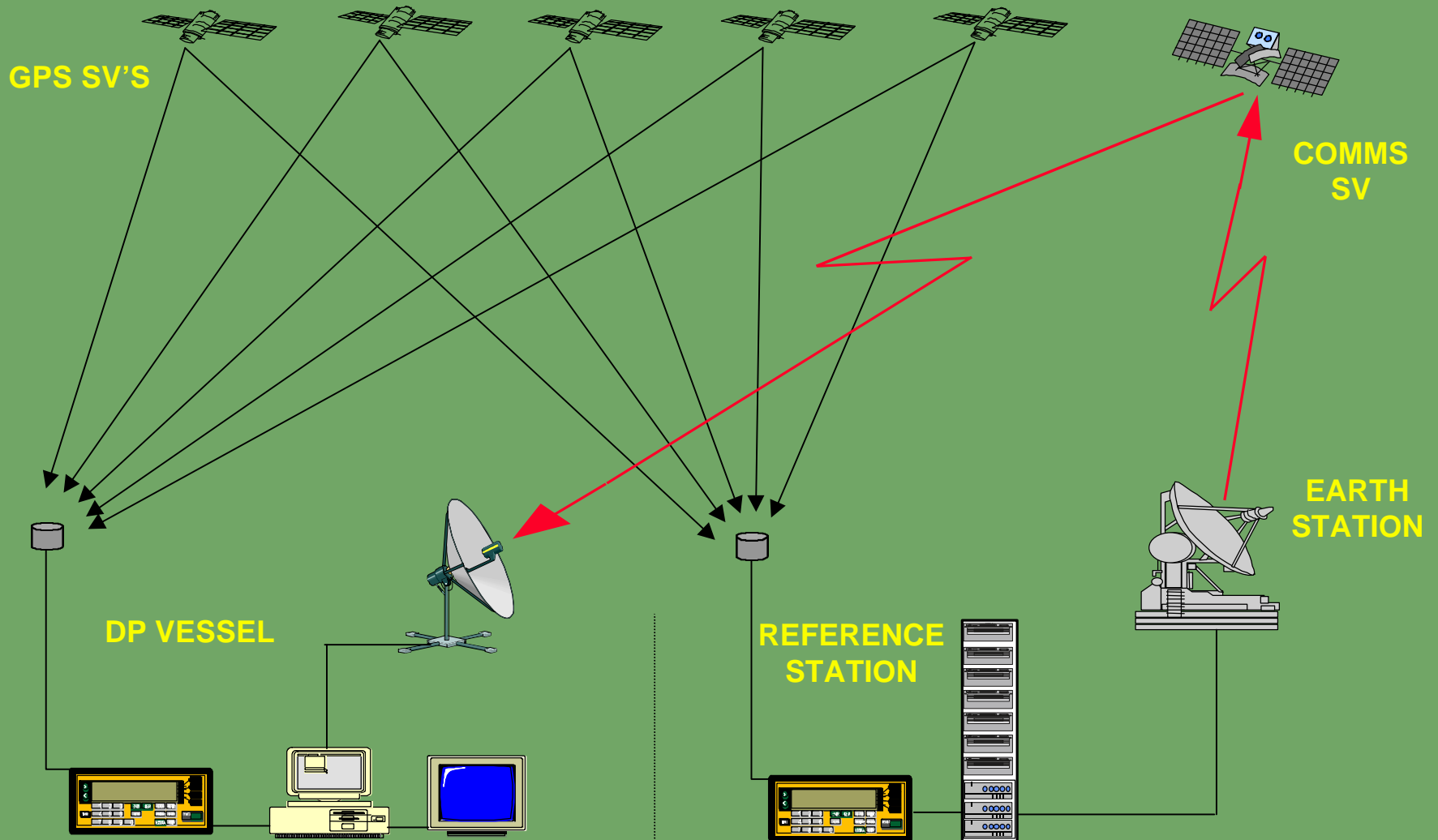

Problem Areas of DGPS
Dynamic Positioning Conference
October 13-14, 1998

Problem Areas of DGPS

- Presented By Racal NCS
- Reference UKOOA/IMCA Guidelines on the Use of DGPS as a Position Reference in DP Systems
- Contents
- Outline of a DGPS Positioning System
- Problems associated with DGPS Components

A Typical DGPS Configuration



DGPS Components

- GPS Satellites Ground and Space Segments
- Satellite Signals, Timing and Reception
- Offshore Equipment Configuration
- Offshore Equipment Installation
- Differential Signal Calculation and Monitoring
- Differential Signal Tx and Rx Methods
- DP Interfacing and Quality Confidence

GPS Configuration, Problems

- Rollover
- Satellite Health
- Satellite Coverage
- Prediction Software PDOPS
- Multipath
- Y2000

Offshore Equipment Configuration

- Receiver Design
- Differential Signal Reception Type
- Satellite Visibility, GPS and Comms.
- Local Radio Interference and Jamming
- DP Vessel Working location

Offshore Equipment Installation

- DP Interfacing
- Antenna Location, Masking
- Cable Runs
- Power Supplies
- Application of Offsets
- Trials and Testing
- Training, Manuals and Reports

Diff. Signal Calculation and Monitoring

- Reference Stations Single or Multiple
- Redundancy at Reference Stations
- Multipath Audits
- Local Support
- Transmission Methods Land Lines, V Sat
- Down Time on Networks and Ref. Stns.
- Latency Versus Update rate
- Integrity Monitoring

Differential Signal Tx and Rx Method

- Communication Satellites
- Line of Sight UHF Transmission
- Over Horizon MF Transmission
- Coastal Networks Lighthouses, Coastguard
- Inter Field or Platform Based Systems

DP Interfacing and Quality Confidence

- Pseudo Artemis Interfaces
- Pseudo Syledis Interfaces
- NEMA
- Konsberg / Simrad
- How do DP Systems Use DGPS Quality Indicators?

Proposed UKOOA/IMCA DQI Matrix

DQI	Diff Link Status	Position Mode	No. of SV Used	Measure of Solution Fit - LPME	Dilution of Precision	Range Accuracy	Age of Correction	Position Precision
0	Off	3D+T	>4	>20	<2	>16		100m
1	Off	3D+T	>4	<20	<2	<16		20m
2	On	2D+T	<4		>2	>16	20>A>10	10m
						<16	30>A>20	10m
3	On	2D+T	<4		<2	>16	10>A>5	5-10m
						<16	20>A>10	5-10m
4	On	2D+T	>4	<2	<2	>16	20>A>10	<5m
						<16	30>A>20	<5m
5	On	2D+T	>4	<2	<2	>16	10>A>5	<5m
						<16	20>A>10	<5m
6	On	3D+T	6>N>4	>2	>3	>16	20>A>10	<5m
						<16	30>A>20	<5m
7	On	3D+T	6>N>4	<2	<3	>16	20>A>10	3-5m
						<16	30>A>20	3-5m
8	On	3D+T	>6	1>L<2	>3	>16	10>A>5	3-5m
						<16	20>A>10	3-5m
9	On	3D+T	>6	<1	<3	>16	10>A>5	1-3m
						<16	20>A>10	1-3m

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DQI	Diff Link Status	Position Mode	No. of SV Used	Measure of Solution Fit - LPME	Dilution of Precision	Range Accuracy	Age of Correction	Position Precision
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9	On	3D+T	>6	<1	<3	>16	10>A>5	1-3m

Conclusions

- Be aware of the reliability and features of the system purchased or leased
- When purchasing consider where your vessel will be working
- Where is the support located, on phone, available to visit vessel?
- Provide a first level fault finding procedure for DPO's
- Keep current on the latest systems available from your provider