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## Minutes of the County Commissioners of Worcester County, Maryland

July 31, 2018

Work Session

Diana Purnell, President  
Theodore J. Elder, Vice President  
Anthony W. Bertino, Jr.  
Madison J. Bunting, Jr.  
James C. Church  
Merrill W. Lockfaw, Jr.  
Joseph M. Mitrecic

The Commissioners conducted a work session to discuss interference and other related issues with the P25 Radio System Project with Harris Corporation and to meet with representatives from Federal Engineering (FE), Inc. of Fairfax, Virginia to consider their proposal to provide engineering consultant services, through the completion of the 800 MHZ P25 Radio System Migration Project to resolve outstanding issues with the public safety radio system. Those in attendance at the work session included Emergency Services Director Fred Webster and Assistant Director James Hamilton, Harris Program Manager Brian Blacketer, System Engineering Director Ben Ramsey, and Sales Representative Mike Kirwick, and Federal Engineering President and founder Ron Bosco and Senior Consultant Adam Nelson.

Mr. Webster reviewed a summary of the discussion that took place during a meeting in Ocean Pines between Commissioner Bertino, County staff, Worcester County Volunteer Fire Company leadership, and representatives from Harris Corporation. Commissioner Bertino noted the meeting occurred on June 26, 2018, not July 26, 2018, as indicated in the summary and requested a revised copy of the minutes.

Mr. Webster presented a timeline of operational issues that have occurred since activating the P25 Radio System on February 14, 2018, when users migrated from the Enhanced Digital Access Communication System (EDACS) to the new P25 Radio System and other documents in the meeting package. He reviewed the history of the Mystic Harbour tower site in West Ocean City (WOC) from fall 2015 through the present, and explained that County staff is currently awaiting delivery of microwave equipment and radios to complete the final link to the Central Tower. Harris representatives must complete known remaining contractual items and receipt of needed equipment for the final transmitter site at Mystic Harbour in West Ocean City (WOC), and the new system must pass a second round of coverage testing during summer months when trees are in full foliage and can cause signal attenuation.

Mr. Hamilton presented a report entitled "Co-Chanel Interference, Worcester County, Maryland," outlining the 10 800 MHZ non-public safety specific frequencies awarded to the County by the Federal Communications Commission (FCC), in which some interference was noted over the 16 years that they were used by the EDACS; Frequencies shared with Virginia Beach and Hampton, Virginia, State Police in Port Elizabeth, New Jersey, Baltimore County,

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Fairfax County, Lynchburg, Virginia, the Commonwealth of Massachusetts, and many others; Causes of Interference, known as “Co-Channel Interference,” which is created when two or more signals from different sources occupy the same frequency; Tropospheric Propagation, which may cause an FM radio station with regularly clear reception to become broken and mixed with another station on certain days of the year; Tropospheric Ducting, when radio waves normally blocked by the curvature of the earth are carried in a duct in the atmosphere between two different areas; Tropospheric Bending, when signals reflect off the troposphere to other areas; Radio System Issues impacted by tropospheric propagation; Agencies that have overcome high levels of co-channel interference; Steps taken by Worcester County staff to resolve co-channel interference; Possible Interference Mitigation Options; and Next Steps, which include looking for different frequencies with less interference.

Commissioner Bertino expressed great frustration that, at the tail end of a three-year radio project that cost the County roughly \$5 million, those involved from the start were only now considering the public safety impacts of tropospheric propagation on radio coverage when they had known as far back as 2015 that this could be an issue. He further stressed that this lapse could cost lives and require a great deal of money to rectify. In response to a question by Commissioner Bertino, Mr. Hamilton advised that co-channeling has always been an issue, but with the EDACS disruptions occurred less than a few hours per year and never resulted in destructive interference, as it has with the P25 digital system. However, with recent technological advances, radio traffic has increased dramatically and rapidly and warmer temperatures cause tropospheric propagation to occur more frequently. He explained that, when tropospheric propagation occurs, signals from other sources may briefly occupy the same frequency Worcester County public safety resources are utilizing. For example, a frequency occupied by an FM radio station may normally have clear reception, but that same signal may become broken or mixed with another station on certain days of the year due to seasonal weather patterns, which are occurring now with greater frequency in areas along large bodies of water. Mr. Hamilton stated that tropospheric interference impacted day-to-day operations of the P25 Radio System in June, when the warm weather provided the ideal conditions for tropospheric propagation, which resulted in periods of no coverage. He advised that two options may be available to resolve this issue: acquire new 800 MHz channels, which may be cleaner, but which will require significant monitoring and testing; or increase RF density to overcome co-channel signals, which may require adding more tower sites at considerable expense. Mr. Hamilton advised that County staff first became aware of interference issues in May 2018, and while they have been working diligently to resolve coverage failures, it is imperative that they hire a consultant who is uniquely qualified to identify and resolve issues pertaining to this problem to complete the County project.

Addressing Harris representatives, who have installed radio systems nationwide, Commissioner Bertino first confirmed that they had experience in resolving interference issues before and then asked why they had not done so with this project. Mr. Kirwick stated that Harris representatives have worked within the scope of the project specified by the County, and since the County was plagued by major interference in June, they have worked closely with County staff to address the situation so that it does not occur again next June, when weather patterns are likely to cause similar issues.

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In response to a question by Commissioner Mitrecic, Mr. Hamilton confirmed that representatives from Delmarva Power have been involved in project discussions for the transmitter site at Mystic Harbour from the beginning of that portion of the project. Commissioner Mitrecic expressed frustration with County coordination of the power issues at that site and was surprised to find out just recently that the equipment was not operational.

In response to a question by Commissioner Bunting, Mr. Hamilton stated that the tower has been erected at the Mystic Harbour site, and the transmitter should be delivered, installed, and tied in with other County sites by late August to allow Harris to complete the required testing in September 2018. Commissioner Bunting asked County staff and Harris representatives if bringing the Mystic Harbour site online would resolve interference issues. Mr. Kirwick stated tropospheric issues are difficult to resolve, so he could not guarantee that once the Mystic site was online and the entire radio system operational that interference would no longer be an issue. However, he guaranteed that Harris representatives would work with the County to identify solutions; though, such solutions may exceed the scope of the proposal between the County and Harris, thus resulting in additional County funding to implement.

In response to a comment by Commissioner Church, Mr. Kirwick confirmed that interference issues, like those that plagued Worcester County in June, and prior to last month Harris did not have the equipment available to predict such issues. Therefore, the interference could not be identified until the bulk of the system, except the Mystic Harbour site, was up and running.

With regard to staff's recommendation to bring a consultant on board before the Mystic Harbour site is operational, Commissioner Bunting questioned why issues that Harris Corporation is contractually obligated to address are included in the FE proposal. He suggested eliminating issues that Harris is contractually obligated to resolve from the FE proposal to reduce the cost of consulting services and limit FE's scope of work to developing solutions to the radio interference problem. Mr. Bosco stated that FE's proposal may seem wide ranging, but that it was designed that way to address all issues, from weather to contractual issues with Harris. FE will act as the County's trusted advisor, with 35 years of experience in radio projects like this one. He stated that FE is currently working with the City of Los Angeles, California to build a \$655 million radio system project, and while there are a multitude of small issues that come up, interference is not one of them, nor can any of the parties involved afford for interference to be an issue. He stated that FE can provide insight and modeling that will allow the County to make the business decisions necessary to correct interference and other radio system issues.

In response to questions by Commissioner Elder, Mr. Hamilton advised that signals at remote sites are being tested throughout the County, as part of a coverage acceptance test plan. Mr. Webster advised that changes in construction standards make it difficult or impossible to obtain a radio signal within certain buildings, but in those cases, equipment can be installed to extend or boost the signals. Commissioner Elder asked Mr. Bosco to explain the benefit of hiring a consultant now instead of after the Mystic Harbour site is operational. Mr. Bosco stated that FE utilizes a commercial version of the software program used by the Federal Aviation Administration (FAA) and the United States armed forces to consider all factors and predict how the Worcester County radio system will work even before the sixth site is operational.

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In response to a question by Commissioner Lockfaw, Mr. Bosco stated that FE cannot guarantee or accept ultimate responsibility for making the County's \$5.4-million radio system project work; however, FE has completed numerous projects and never failed to find a workable solution to resolve the issues that have occurred. Furthermore, he guaranteed that FE will provide solutions that can be implemented to address the issues and guarantee that FE's work meets industry standards. In response to a question by Commissioner Mitrecic, Mr. Bosco urged the Commissioners to call FE's references and ask whether the recommendations given to them by FE were practical and solved their problems. He stated that FE has worked with hundreds of companies during the past 35 years, and they have the tools to identify problems, even before a system is up and running, and develop solutions.

In response to a question by Commissioner Bertino, Mr. Hamilton advised that the County has 10 radio channels, which were allocated based on actual usage. Mr. Nelson advised that in order to get additional 800 MHZ frequencies, the County must be able to justify the licensing of them by the Federal Communications Commission (FCC) based on usage.

In response to a question by Commissioner Church, Mr. Bosco stated that interference issues are weather dependent and historically occur at around the same time each year.

In response to a question by Commissioner Purnell, Assistant Chief Administrative Officer Kelly Shannahan advised that the County purchased the microwave equipment to be installed at the Mystic Harbour site directly from the vendor, Eastern Communications, as a cost-saving measure recommended by Harris.

Commissioner Bertino recognized Ocean Pines Volunteer Fire Department (OPVFD) President Billy Bounds and Chief Steve Grunewald, both of whom participated in the meeting with Harris representatives on June 26. Mr. Bounds stated that they had not received the demo radios of a different model that Harris representatives agreed to provide the fire companies following their June 26 meeting. Furthermore, the OPVFD has experienced one to two interference issues since receiving the online reporting tool last week, and overall the OPVFD does not feel confident that the new radio system will work effectively in an emergency.

With regard to a question by Commissioner Bertino, Chief Administrative Officer Harold Higgins advised that staff could identify funds in the budget to cover the cost of the FE proposal.

Commissioner Lockfaw stated that he previously opposed hiring a consultant until after the Mystic Harbour site was up and running, but for the sake of public safety it is imperative to bring a consultant onboard now. Therefore, he made a motion to accept the proposal from FE on a time and materials basis at a maximum cost of \$77,265 to provide consulting services to help resolve public safety radio system interference and other related issues with the P25 radio system project through the completion of the 800 MHZ P25 Radio System Migration Project. Commissioner Church seconded the motion, stating that he hoped his fellow Commissioners would vote to accept the FE contract today, so that there would be no further delays in resolving these public safety issues.

Commissioner Bertino stated that the Commissioners should postpone taking any action on the proposal from FE until County staff can check their references. Commissioner Mitrecic stated concern that interference issues may place first responders in harm's way; therefore, he could support bringing the consultant onboard before the Mystic Harbour site is operational. However, he concurred that the County should check FE's references.

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Commissioner Bunting stated that the Commissioners should not postpone hiring a consultant until the Mystic Harbour tower is online; however, he urged his fellow Commissioners to postpone voting on this matter until they meet the following week on August 7, 2018, to give staff an opportunity to contact FE's references. In response to a question by Commissioner Church, Mr. Bosco stated that FE offers a coverage workshop that can evaluate radio system operations now versus how it will work once the Mystic Harbour site is operational. He stated that the tower may or may not resolve the problem, but everyone involved in the project will know what's going to happen prior to it coming online. Mr. Bosco offered to conduct the Coverage Workshop for the County at no extra cost if the Commissioners accept their proposal. Mr. Ramsey stated that Harris uses a Raptor software program that they utilize to make coverage predictions before a system is built.

Commissioner Bertino stipulated that any contract between the County and FE should state that the consultants are to report directly to the Commissioners' Office.

Commissioner Purnell stated that the County should have hired a consultant at the start of the project, and in the interest of public safety she urged her fellow Commissioners to award the consulting contract to FE.

Following much discussion and upon a motion by Commissioner Mitrecic, the Commissioners voted 6-1, with Commissioner Church voting in opposition, to table Commissioner Lockfaw's motion until they meet on August 7, 2018 to provide staff with an opportunity to review FE's references.

The Commissioners adjourned their work session to meet again on August 7, 2018.