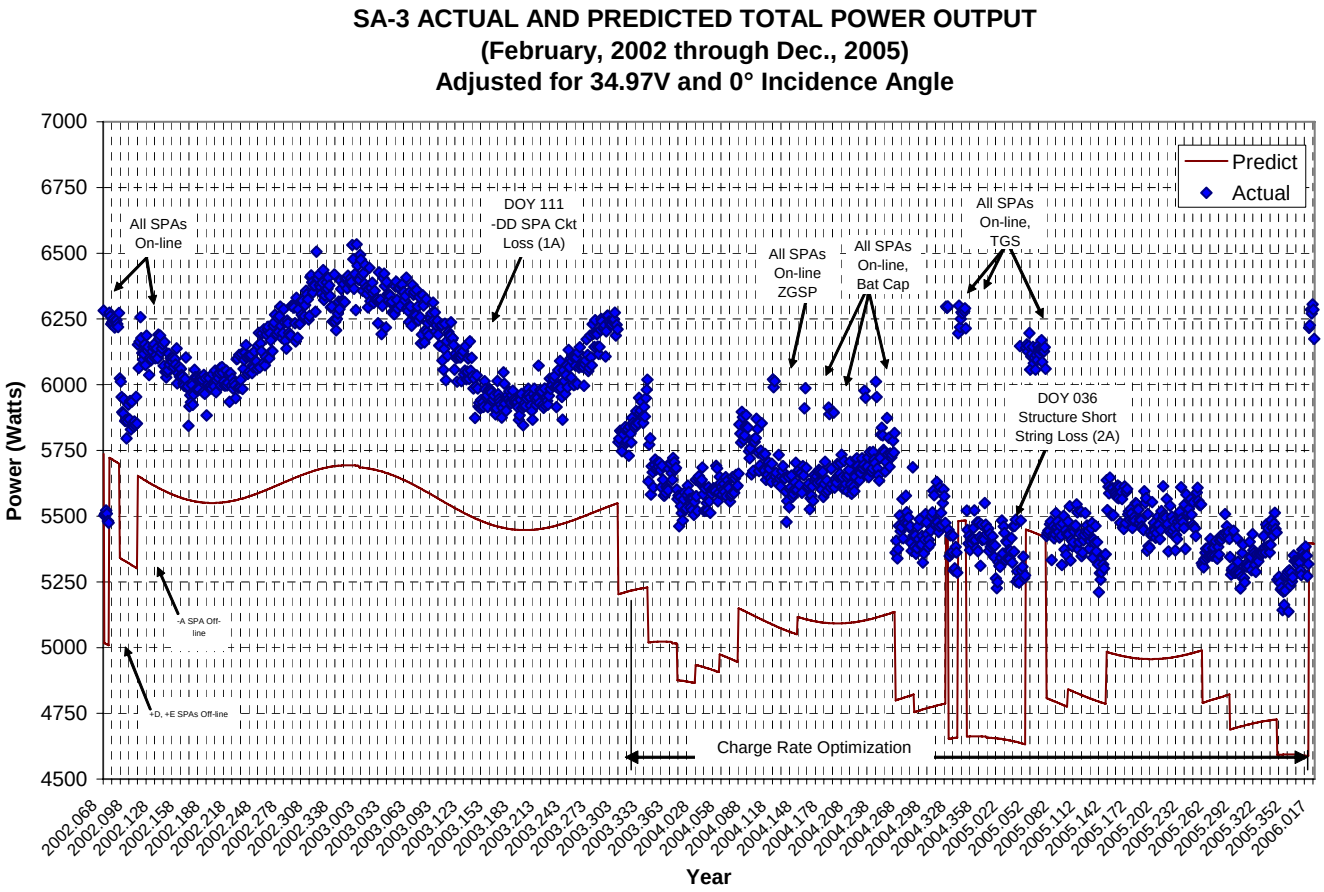


The Hubble Space Telescope is located in a low-Earth orbit at an altitude of about 370 kilometers, with an orbit period of about 90 minutes. The constant impact of high-energy particles on the solar panels causes a steady decrease in the power output of these panels over time as the trend in the graph shows.

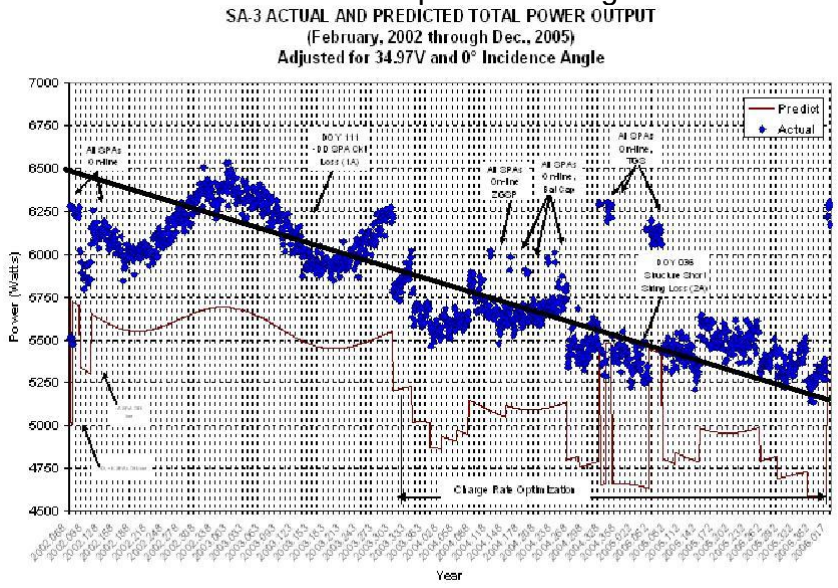
Problem 1 - Draw a line that passes through the middle of this curve from left to right.

Problem 2 - What is the average slope of this solar power curve in watts/year?

Problem 3 - What is the percent change in the solar power in percent/year?

Problem 4 - What is the wattage of the solar panels by 1/1/2015?

Problem 1 - Draw a line that passes through the middle of this curve from left to right.



Problem 2 - What is the average slope of this solar panel power curve in watts/year?

Answer: Slope = (y2 - y1) / (x2 - x1). For reasonable choices of the points (x1,y1) and (x2, y2) as for instance (2002.068, 6500) on the far-left and (2006.017,5250). Next, we have to calculate the number of years between the given dates. This is about 2006.017-2002.068 or 3.9 years. Then the slope is just m = (5250-6500)/(3.9)
And so **m = -320 watts/year**.

Problem 3 - What is the percent change in the solar power in percent/year?
Answer: The average amperage during this time is just (6500+5250)/2 = 5875 watts, so the average rate of change of the power is just P = 100% x (-320/5875)
so **P = -5.4%/year**.

Problem 4 - What is the wattage of the solar panels by 11/1/2015?

Answer: The number of years since 2002.068 is just 12.9 years, so the power loss from the aging panels is just A = 6500 - 320 x 12.9 so **A = 2,372 watts.**