1067-49-347   **Elena Constantin*** (`constane@pitt.edu`), Department of Mathematics, University of Pittsburgh at Johnstown, 450 Schoolhouse Road, Johnstown, PA 15904. *Second Order Necessary Conditions in Scalar Nonsmooth Set Constrained Optimization.*

We are concerned with the following optimization problem

$$F(\bar{x}) = \text{Local Minimum } F(x), \text{ subject to } x \in D, \qquad (P)$$

where $F : X \to \mathbb{R}$, and D is an arbitrary subset of the Banach space X.

We develop second-order necessary conditions for problem (P) using the first and second-order upper generalized derivatives of the nonsmooth objective function F. Our optimality conditions are formulated in terms of Pavel and Ursescu's tangent cones to the constraint set at the extremum point. We describe the second-order tangent cones to equality and inequality constraint sets given by means of a functional G under various hypotheses on G.

We analyze an example to illustrate the applicability of our results. (Received August 25, 2010)